



HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

CANADA AND THE DEFENCE OF NORTH AMERICA

Report of the Standing Committee on National Defence

**Hon. Peter Kent
Chair**

JUNE 2015

41st PARLIAMENT, SECOND SESSION

Published under the authority of the Speaker of the House of Commons

SPEAKER'S PERMISSION

Reproduction of the proceedings of the House of Commons and its Committees, in whole or in part and in any medium, is hereby permitted provided that the reproduction is accurate and is not presented as official. This permission does not extend to reproduction, distribution or use for commercial purpose of financial gain. Reproduction or use outside this permission or without authorization may be treated as copyright infringement in accordance with the *Copyright Act*. Authorization may be obtained on written application to the Office of the Speaker of the House of Commons.

Reproduction in accordance with this permission does not constitute publication under the authority of the House of Commons. The absolute privilege that applies to the proceedings of the House of Commons does not extend to these permitted reproductions. Where a reproduction includes briefs to a Standing Committee of the House of Commons, authorization for reproduction may be required from the authors in accordance with the *Copyright Act*.

Nothing in this permission abrogates or derogates from the privileges, powers, immunities and rights of the House of Commons and its Committees. For greater certainty, this permission does not affect the prohibition against impeaching or questioning the proceedings of the House of Commons in courts or otherwise. The House of Commons retains the right and privilege to find users in contempt of Parliament if a reproduction or use is not in accordance with this permission.

Also available on the Parliament of Canada Web Site
at the following address: <http://www.parl.gc.ca>

CANADA AND THE DEFENCE OF NORTH AMERICA

Report of the Standing Committee on National Defence

**Hon. Peter Kent
Chair**

JUNE 2015

41st PARLIAMENT, SECOND SESSION

STANDING COMMITTEE ON NATIONAL DEFENCE

CHAIR

Hon. Peter Kent

VICE-CHAIRS

Jack Harris

Joyce Murray

MEMBERS

James Bezan

Tarik Brahmi

Corneliu Chisu

Cheryl Gallant

Élaine Michaud

Rick Norlock

John Williamson

OTHER MEMBERS OF PARLIAMENT WHO PARTICIPATED

Dean Allison

Stella Ambler

Denis Blanchette

Patrick Brown

John Carmichael

Arnold Chan

Robert Chisholm

Joe Daniel

Don Davies

Jean-François Fortin

Marc Garneau

Dan Harris

Jim Hillyer

Ted Hsu

Roxanne James

François Lapointe

Jean-François Larose

Chungsen Leung

Larry Maguire

Hoang Mai

Hon. John McCallum

Hon. John McKay

Larry Miller

Jamie Nicholls

José Nunez-Melo

Ted Opitz

LaVar Payne
John Rafferty
Hon. Geoff Regan
Jean Rousseau
Jasbir Sandhu
Bev Shipley

Mike Sullivan
Glenn Thibeault
David Tilson
Dave Van Kesteren
Mark Warawa
Wai Young

CLERK OF THE COMMITTEE

Evelyn Lukyniuk

LIBRARY OF PARLIAMENT

Parliamentary Information and Research Service

Martin Auger, Analyst
Melissa Radford, Analyst
Katherine Simonds, Analyst

STANDING COMMITTEE ON NATIONAL DEFENCE

CHAIR

James Bezan

VICE-CHAIRS

Jack Harris

Hon. John McKay

MEMBERS

Chris Alexander

Chrsitine Moore

Tarik Brahmi

Rick Norlock

Corneliu Chisu

Ted Opitz

Cheryl Gallant

Mark Strahl

Jean-François Larose

OTHER MEMBERS OF PARLIAMENT WHO PARTICIPATED

Hon. Gerry Byrne

CLERK OF THE COMMITTEE

Leif-Aune Aune

LIBRARY OF PARLIAMENT

Parliamentary Information and Research Service

Wolfgang Koerner, Analyst

Melissa Radford, Analyst

THE STANDING COMMITTEE ON NATIONAL DEFENCE

has the honour to present its

THIRTEENTH REPORT

Pursuant to its mandate under Standing Order 108(2), the Committee has studied the defence of North America and has agreed to report the following:

TABLE OF CONTENTS

CANADA AND THE DEFENCE OF NORTH AMERICA.....	1
INTRODUCTION	1
FACING AN UNCERTAIN SECURITY ENVIRONMENT: THREATS TO CANADA AND NORTH AMERICA	3
A. State and Non-State Threats.....	6
B. Aerial Threats.....	8
C. Maritime Threats	9
D. Arctic Threats.....	11
E. Cyber Threats	13
F. Terrorist Threats.....	15
DEFENDING CANADA.....	16
A. The Canadian Armed Forces and the Defence of Canada	16
1. Domain Awareness	16
2. Operational Readiness.....	18
3. Naval Readiness	19
4. Aerial Readiness	22
5. Disaster Relief and Military Aid to Civilian Authorities	24
6. Search and Rescue.....	28
7. Arctic Security	30
B. Strengthening the Canadian Armed Forces and Canada's Defences	34
1. Reviewing Defence Policy.....	34
2. Strengthening and Improving Recruitment.....	35
3. Enhancing Domain Surveillance and Enforcement Capabilities	36
4. Improving Cyber Security	39
5. Improving Defence Procurement.....	42
DEFENDING THE NORTH AMERICAN CONTINENT IN COOPERATION WITH THE UNITED STATES	44
A. The Canada-U.S. Defence Relationship	44
1. NORAD	45
2. Canada-U.S. Civil Assistance Plan	49
3. The Tri-Command Structure.....	50

B. Strengthening Continental Security in Cooperation with the United States	52
1. Expanding NORAD and its Domain Awareness Capabilities	52
2. Reviewing the Tri-Command Structure	56
3. Improving Cooperation in Times of Civil Emergencies	57
4. Arctic Cooperation.....	59
5. Cyber Defence Cooperation	60
6. Participating in Ballistic Missile Defence	61
CONCLUDING REMARKS AND RECOMMENDATIONS	64
APPENDIX A: LIST OF WITNESSES – 41 ST PARLIAMENT, SECOND SESSION	67
APPENDIX B: LIST OF WITNESSES – 41 ST PARLIAMENT, FIRST SESSION	71
APPENDIX C: LIST OF BRIEFS	73
REQUEST FOR GOVERNMENT RESPONSE	75

CANADA AND THE DEFENCE OF NORTH AMERICA

INTRODUCTION

During the 1st and 2nd Sessions of the 41st Parliament, the House of Commons Standing Committee on National Defence (the Committee) studied how the Canadian Armed Forces (CAF) defend Canada and contribute to the defence of North America in collaboration with the United States (U.S.).

In 2008, the federal government outlined the following three key roles for the CAF in its *Canada First Defence Strategy*: to defend Canada; to defend North America in cooperation with the U.S.; and to contribute to international peace and security.¹

The defence of Canada is the primary mission of the CAF. Domestic defence is a complex mission that involves a wide range of responsibilities, from regularly training and preparing for war to safeguarding Canadian territory, monitoring and patrolling Canada's skies and waters, exercising sovereignty in the Arctic and elsewhere, conducting search and rescue, supporting domestic law enforcement agencies, and assisting civilian authorities with disaster relief in times of emergency, among other things.² Every day, thousands of CAF members put their lives on the line to defend Canada and its citizens.

While domestic defence remains the central mission of the CAF, the armed forces also contribute to continental defence in cooperation with the U.S. For more than 70 years, Canada and the U.S. have been close partners in defending North America against a range of threats. Over the years, the two countries have cultivated a strong and long lasting defence relationship that has more than once stood the test of time. Today, Canada and the U.S. are not only strong and reliable NATO partners, they also maintain one of the closest and most robust binational defence relationships in the world, cooperating extensively with one another and regularly exchanging valuable intelligence and military resources to protect the North American continent they share. The two countries are not only neighbours and trading partners, but also very close friends and military allies. According to the Department of National Defence (DND), "the United States is Canada's most important ally and defence partner."³ This view is shared by the U.S. Department of State, which maintains that "U.S. Defense arrangements with Canada are more extensive than with any other country."⁴

Few people would have predicted the extent of this strong binational defence relationship when in August 1938 – just a year before the outbreak of the Second World War in Europe – U.S. President Franklin D. Roosevelt and Canadian Prime Minister

1 Department of National Defence (DND), [Canada First Defence Strategy](#), 2008, pp. 7-10.

2 House of Commons Standing Committee on National Defence (NDDN), [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare).

3 DND, ["Backgrounder: The Canada-U.S. Defence Relationship"](#), 4 December 2014.

4 United States Department of State, ["Fact Sheet: U.S. Relations with Canada"](#), 10 September 2014.

William Lyon Mackenzie King made the first pledges of continental defence assistance between Canada and the U.S., each vowing for their countries to come to each other's aid in the event of attack or invasion by foreign powers.⁵

That said, Canada and the U.S. established the basic foundation of a formal defence relationship during the Second World War. In August 1940 – almost a year after the outbreak of the war in Europe – the two countries signed the Ogdensburg Agreement, which set up the Permanent Joint Board on Defence (PJBD), a binational defence forum to discuss and advise on defence policy issues related to continental defence and security. Still active today, the PJBD represents the oldest Canada-U.S. binational defence forum.⁶

Since then, Canada and the U.S. have strengthened their defence relationship and established a wide range of binational defence forums and agreements, such as the Military Cooperation Committee, which was created in 1946 to serve as the primary point of contact between the Canadian and U.S. joint military staffs,⁷ as well as the Defence Production Sharing Agreement of 1956 and the Defence Development Sharing Agreement of 1963, which were signed to enhance defence industrial and defence research and development cooperation between the two countries.⁸

The North American Aerospace Defence Command (NORAD) is arguably the most well-known of these binational defence agreements today. Established in 1957, NORAD is a Canada-U.S. binational organization that provides early warning of aerospace and, since 2006, maritime threats to North America. For almost 60 years, it has served as North America's first line of defence against air attacks. To many Americans and Canadians, NORAD symbolizes the close bilateral defence relationship both countries have maintained for decades and the extent to which their respective countries are determined to protect the North American continent and their homelands from a range of threats.⁹

Defending Canada and the continent is a complex and challenging responsibility. Professor James Fergusson of the University of Manitoba described the “subject of the defence of North America” as “an extremely broad, deep, and complicated one, especially in terms of the range of issues involved, encompassing land, sea, air, outer space, [and] the cyber world ... among other issues.”¹⁰ All the more challenging is the geography. Canada is a vast country and North America one of the largest continents to defend, even in cooperation with the U.S.

5 Stanley Dziuban, *Military Relations Between the United States and Canada, 1939-1945*, Washington D.C., United States Army Center of Military History, 1959, pp. 3-4.

6 C.P. Stacey, *Arms, Men and Governments: The War Policies of Canada, 1939-1945*, Ottawa, Queen's Printer, 1970), 327-395.

7 DND, “[Backgrounder: The Canada-U.S. Defence Relationship](#).”

8 Government of Canada, “[Buy American and Defense Contracts: Defence Production Sharing Agreement Between Canada and the United States of America](#)”; Industry Canada, “[Defence Development Sharing Agreement Between Canada and the United States of America](#)”.

9 DND, “[Backgrounder: NORAD](#),” 11 September 2014.

10 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (James Fergusson).

The Committee undertook the present study in order to gain a better understanding of the existing, emerging and potential threats to Canadian security and how the CAF contributes to the defence of Canada and North America in collaboration with the U.S. While the current study focuses primarily on how Canada defends itself and cooperates with the U.S. in the defence of North America, it should be noted that Canada has also been strengthening its defence relations with Mexico in recent years.¹¹

The Committee held 24 hearings on the subject between March 2014 and March 2015. Before those hearings, the Committee had the opportunity to travel to the CAF naval base in Esquimalt, British Columbia, in April 2013 to better understand the Royal Canadian Navy's (RCN) state of readiness and its contributions to the defence of our country and our continent. The Committee also travelled to Washington D.C. and Colorado Springs in the U.S. in May 2013 to hear from U.S. government and military representatives about the Canada-U.S. defence relationship and, more specifically, NORAD. It should be noted that the Committee also planned to visit several CAF bases and infrastructures in Eastern and Western Canada as well as in the Arctic in 2014 and 2015, but was unfortunately unable to travel for political reasons.

The report is subdivided into four sections. The first section provides an assessment of the international security environment and threats to Canada and North America. The second section investigates how Canada defends its territory and contributes to North American defence independently. It also identifies possible areas of improvement to strengthen Canada's capacity to defend its sovereign territory. The third section looks at how Canada and the U.S. contribute to the defence of North America by working cooperatively. It also looks at areas where there could be increased cooperation between Canada and the U.S. in the defence of North America. The final section provides concluding remarks and recommendations.

Based on the testimony received over the course of the study and along with publicly available information, the Committee offers the following report to the House of Commons.

FACING AN UNCERTAIN SECURITY ENVIRONMENT: THREATS TO CANADA AND NORTH AMERICA

Like many other countries worldwide, Canada faces an unpredictable and volatile international security environment. Over the past 15 years, the number of armed conflicts and violent crises around the world has steadily risen.¹² These conflicts, in turn, have heightened insecurity globally, as the recent crises in Ukraine and the ongoing war against the terrorist organization calling itself Daesh (also known as the Islamic State of Iraq and the Levant, or ISIL, and the Islamic State of Iraq and Syria, or ISIS) in Iraq and Syria can attest. Colin Robertson, Vice-President of the Canadian Defence and Foreign Affairs

11 For more information on the Canada-Mexico defence relationship, see DND, "[Backgrounder : The Canada-Mexico Defence Relationship](#)," 25 April 2014.

12 Heidelberg Institute of International Conflict Research, [Conflict Barometer 2014](#), Heidelberg, University of Heidelberg, March 2015, pp. 15-19; Human Security Report Project, [Human Security Report 2013](#), Vancouver, Simon Fraser University, 2013, pp. 81-113.

Institute (CDFAI), told the Committee that “instability continues in the Middle East and North Africa” and that “maritime territorial disputes between China and its neighbours are coming to a head in the East and South China seas.” “We live in a world of sovereign states pursuing sovereign interests” and “force counts,” Mr. Robertson told the Committee.¹³ Russia’s illegal occupation and annexation of Crimea in violation of basic principles of international law in 2014 is a case in point.

At the same time, military spending has been increasing in certain regions of the world. Over the past 15 years, global military spending has grown significantly, from US\$839 billion in 2001¹⁴ to US\$1,776 billion by 2014.¹⁵ Although military spending has fallen in North America and Western and Central Europe over the last 10 years — mostly as a result of recent austerity measures and ongoing efforts to control budget deficits — it has been increasing in Asia, Africa, Eastern Europe, Latin America, the Middle East and Oceania due to a combination of factors that include economic growth, internal politics, security concerns, and geostrategic ambitions (See Table 1).¹⁶ In other words, more and more countries are raising their defence budgets and enhancing their military capabilities.

Table 1: Global Military Expenditure in 2014¹⁷

Regions	Military Spending 2014 (US\$ Billion)	Change 2005-2014 (%)
Africa (North Africa)	20.1	+144
Africa (Sub-Saharan Africa)	30.1	+66
Americas (North America — Canada / U.S.)	627.0	-0.3
Americas (South America)	67.3	+48
Americas (Central America and Caribbean)	10.4	+90
Asia (Central and South Asia)	65.9	+41
Asia (East Asia)	309.0	+76
Asia (South East Asia)	35.9	+45

13 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson).

14 Elisabeth Sköns et al., “[Military Expenditure](#),” in *SIPRI Yearbook 2002: Armaments, Disarmament and International Security*, Stockholm International Peace Research Institute [SIPRI], pp. 231–265.

15 Sam Perlo-Freeman, Aude Fleurant, Pieter D. Wezeman and Siemon T. Wezeman, “[Trends in World Military Expenditure, 2014](#),” *SIPRI Fact Sheet*, April 2015.

16 Sam Perlo-Freeman et. al., “[Trends in World Military Expenditure, 2014](#),” SIPRI, “[Military Spending in Europe in the Wake of the Ukraine Crisis](#),” *Media Backgrounder*, 13 April 2015; “A Delicate Equilibrium,” *Jane’s Defence Weekly*, Vol. 52, No. 8 (25 February 2015), pp. 28-31.

17 All defence expenditure figures are in US\$ at current market prices and exchange rates. Figures for changes in the 10-year period 2005 to 2014 are calculated from spending figures in constant (2011) prices.

Europe (Eastern Europe)	93.9	+98
Europe (Western and Central Europe)	292.0	-8.3
Middle East	196.0	+57
Oceania	28.0	+26
Top 10 Military Spending Countries		
United States	610	-0.4
China	216	+167
Russia	84.5	+97
Saudi Arabia	80.8	+112
France	62.3	-3.2
United Kingdom	60.5	-5.5
India	50.0	+39
Germany	46.5	-0.8
Japan	45.8	-3.7
South Korea	36.7	+34

Source: Sam Perlo-Freeman, Aude Fleurant, Pieter D. Wezeman and Siemon T. Wezeman, [“Trends in World Military Expenditure, 2014,”](#) *SIPRI Fact Sheet*, April 2015.

This trend of militarization is expected to continue in the near future. China, for example, is planning to increase its defence budget by 10% in 2015.¹⁸ Likewise, Russia is in the process of renewing “70% or more of its weapons and equipment inventory by 2020,” according to *Jane’s Defence Weekly*.¹⁹ The Russian government is, in fact, planning to raise defence expenditure by 19.5% in 2015.²⁰

Moreover, new and complex threats stemming from failed and failing states, transnational criminal and terrorist networks, political, ethnic and religious extremism, cyber threats and information warfare, the acquisition and potential use of weapons of mass destruction by state and non-state actors, and global power shifts continue to strain

18 “China Announced 10.1% Military Spending Increase,” *Jane’s Defence Weekly*, Vol. 52, No. 10 (11 March 2015), p. 5.

19 Karl Soper, “Rearming Russia,” *Jane’s Defence Weekly*, Vol. 51, No. 23 (4 June 2014), pp. 28-30. See also SIPRI, [“Military Spending in Europe in the Wake of the Ukraine Crisis.”](#)

20 “Russia Cut Defence Spending by 10% as Economy Takes Battering,” *Jane’s Defence Weekly*, Vol. 52, No. 5 (4 February 2015), p. 10; “Russia Plans Defence Spending Hike for 2015,” *Jane’s Defence Weekly*, Vol. 51, No. 44 (29 October 2014), p.14.

international relationships, undermine stability, and threaten world peace. In addition, climate change and environmental degradation, increased competition for energy and resources, unequal access to potable water and food, global population growth²¹ and mass migrations of people, among other things, could cause instability, exacerbate tensions between states, and potentially result in unrest, regional clashes or humanitarian crises in several regions of the world.²²

Canada and North America are not immune to the volatile and continually changing international security environment. Indeed, the Committee heard from a number of witnesses who outlined key threats to Canada and North America.²³

A. State and Non-State Threats

Canada has a responsibility to be prepared for any possibility and to protect its territory, population and national interests from all types of threats, including the possibility of attack from another state, even if such hostile scenario appears to be remote today. Most witnesses who appeared before the Committee agreed that Canada and the U.S. face no imminent threat of war from another country. “We are not in a cold war,” said Professor Aurel Braun of Harvard University. “The world democracies are not facing a massive military threat from a superpower with tens of thousands of tanks and vast numbers of aircraft ready to march across Europe, or a superpower that is intent on devastating North America or North American cities in an ideologically driven war fought for the purpose of imposing some universalistic doctrine.”²⁴

Jill Sinclair, Assistant Deputy Minister, Policy, DND, Major-General Christian Rousseau, Chief of Defence Intelligence and Commander of Canadian Armed Forces Intelligence Command, and Arthur Wailczynski, Director General of the International Security and Intelligence Bureau at the Department of Foreign Affairs, Trade and Development, expressed a similar view. They told the Committee that no state currently poses a military threat to Canada. However, all three witnesses agreed that Canada faces a number of non-military threats to its security, such as terrorism, illicit trafficking of narcotics, and human and weapon smuggling.²⁵

Ferry de Kerckhove and George Petrolekas of the Conference of Defence Associations Institute (CDAI) said that the threat environment is in constant evolution and may change in the near future. “I think it’s a bit diminutive to just say that we don’t face a state threat,” Mr. de Kerckhove told the Committee. “In this day and age, the threats are

21 The world’s population rose from an estimated 5.7 billion in 1994 to 7.2 billion by 2014, and the United Nations expects it to reach more than 8.1 billion in 2025 and over 9.6 billion by 2050. See United Nations, [The World Population Situation in 2014: A Concise Report](#), 2014, pp. iii and 2.

22 DND, [The Future Security Environment 2013-2040](#), Ottawa, Chief of Force Development, 2014, pp. 1-138.

23 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare).

24 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Aurel Braun).

25 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 27 March 2014 (Major-General Christian Rousseau, Jill Sinclair, and Arthur Wailczynski).

really from ills and evils that know no frontier.” Threats can rapidly develop in “another region and make it very dangerous for us.”²⁶

A few witnesses, for example, referred to North Korea and Iran as emerging threats, though we make note of recent diplomatic progress with respect to Iran.²⁷ “Both North Korea and Iran continue to invest in ballistic missiles, nuclear, cyber, and other advanced weapon technologies,” noted Lieutenant-General J.A.J. Parent, Deputy Commander of NORAD. According to Lieutenant-General Parent, North Korea, in particular, with its ballistic missile and nuclear arsenals, is now perceived by NORAD as “a practical and no longer a theoretical threat, one that must be defended against.”²⁸

Several witnesses also spoke about the potential for China and Russia to become threats in the future, though all witnesses agreed that these two powers, despite their actions and rhetoric on the world stage, presently pose no direct threat to North America. All agreed, however, that Canada and the U.S. should continue to monitor closely the actions of China and Russia.²⁹ “There's no question that the so-called authoritarian states [Russia and China] could in fact form an alliance, even a tight alliance, against the democracies,” Professor Charles Doran of John Hopkins University stated. “Such a development would be very bad ... It would be a bellwether of difficult times ahead.”³⁰

The world of tomorrow will, in all likelihood, be very different from the one we live in today and so will future threats. The possibility that a foreign power may pose a direct threat to North America in the future cannot be ruled out. Canada must therefore remain ready to quickly identify and suppress any type of threat against its sovereign territory.

26 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (Ferry de Kerckhove and George Petrolekas).

27 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson); Document prepared by Frank P. Harvey and distributed to the House of Commons Standing Committee on National Defence on 9 May 2014.

28 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

29 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 4 December 2014 (Christopher Sands and Charles Doran); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Brian Bow and Lieutenant General George Macdonald); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Aurel Braun and Colin Robertson); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 1 May 2014 (Alexander Moens).

30 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 4 December 2014 (Charles Doran).

B. Aerial Threats

Canada and the U.S. face a number of threats in the air domain. Major-General Wheeler, Commander of the Royal Canadian Air Force's (RCAF) 1 Canadian Air Division, said that NORAD is keeping an eye out for both "symmetric" and "asymmetric" aerial threats.³¹

Symmetric threats are "state-sponsored threats" posed by the military forces of other countries. They are considered to be the "most dangerous." A typical symmetric threat would come in the "form of foreign, long-range aviation and/or bomber fleets," Major-General Wheeler stated. However, given the current geopolitical climate, the probability of a foreign military aviation attack on North America is "actually low." While "capabilities exist [in other countries] to cause us harm, there is currently no known intent" to do so. That said, if a situation where "hostile intent" from a specific country would become reality, NORAD would have only a limited amount of time to react to an attack. Strategic warning would be measured "in minutes to hours." According to Major-General Wheeler, this is why NORAD has a "requirement to maintain very high readiness levels, even in peacetime" and "continuously tracks and responds to numerous aircraft of interest close to the airspace of Canada and the United States."³²

NORAD, in particular, regularly monitors Russian military aviation activities, especially aircraft that come close to American and Canadian airspace. "Although there is probably a low threat that they [Russians] are going to conduct any sort of attack on North America," Major-General Wheeler told us, "they do train to do that on a regular basis" and this alone warrants close monitoring.³³

Asymmetric threats are those emanating from non-military and non-state actors, notably terrorist organizations. Whereas symmetric threats usually come from outside North America, asymmetric threats often emanate from within. "The September 11 [2001] attack is ... the most tragic example of this, and these threats remain a valid concern with serious security consequences," Major-General Wheeler noted. "As a result, we must be ready for scenarios involving [civilian] aircraft being used to bring harm to populated areas." It is a threat NORAD takes very seriously. Indeed, NORAD has placed greater emphasis on "surveillance and control" of aerial activities occurring within North America's airspace. Since the 2001 terrorist attacks, it has responded to more than 3,500 possible air threats and intercepted more than 1,400 aircraft in the airspace of Canada and the U.S.³⁴

31 In the context of NORAD, symmetric threats (sometimes known as traditional threats) are state-sponsored threats and are usually associated with the military capabilities of foreign armed forces (for example, their military aviation). Asymmetric threats (sometimes known as non-traditional threats) are generally associated with non-state actors (for example, terrorists), but can also entail the covert support of nation-states (for example, through money, capabilities, and training). Asymmetric threats can range from terrorists using civilian aircraft as missiles, as was the case on 11 September 2001, to cyber attacks on critical infrastructures. Andrea Charron and Jim Fergusson, [*NORAD in Perpetuity? Challenges and Opportunities for Canada*](#), Centre for Defence and Security Studies, University of Manitoba, 31 March 2014, pp. 10-15.

32 NDDN, [*Evidence*](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

33 Ibid.

34 Ibid.

However, aerial threats to North America do not simply emanate from military and civilian aviation. Several witnesses emphasized the ballistic missile threat to both Canada and the U.S. Lieutenant-General George Macdonald, a fellow with the CDFAI, told the Committee that while the “missile threat” has not “accelerated,” it “has been gradually evolving over the past several years.” He pointed out that North Korea “now has the ability to launch a missile to North America” and that “Iran continues to develop even longer-range ballistic missiles.”³⁵

In a paper submitted to the Committee, Professor Frank P. Harvey of Dalhousie University emphasized the “new and emerging nuclear threats from North Korea and Iran.” The regime in North Korea, in particular, he wrote, “poses a serious threat to global security, particularly after the launch in December 2012 of the Unha-3 rocket – a three-stage, intercontinental ballistic missile (ICBM) with an estimated range of 10,000 kilometres. When combined with North Korea’s latest underground nuclear test in January 2013, these moves represent a concerted effort by the regime to develop and deploy an offensive nuclear capability that will pose a direct threat to the United States, Canada, and our allies in Asia and Europe.”³⁶

Additional countries have or are in the process of developing similar ballistic missile capabilities. According to NATO, more than “30 countries have or are acquiring ballistic missile technology that could eventually be used to carry not just conventional warheads, but also weapons of mass destruction.”³⁷ Colin Robertson pointed out that “Pakistan, with its missiles and nuclear weapons, if it were to go rogue or lose control of its arsenal ... would be a problem.” In his view, “we will likely see more bad actors” emerging in the near future “with access to warheads, intercontinental missiles, and weapons of mass destruction ... not just nuclear, but also chemical and biological.”³⁸ In his opinion, Canada simply cannot ignore the existence of those capabilities and has a responsibility to remain vigilant and to constantly monitor that threat. “We have to prepare for the worst,” Mr. Robertson stated, “and that would include things like [participating in] ballistic missile defence.”³⁹

C. Maritime Threats

Canada also faces a number of threats in its maritime domain. Canada is a maritime country with significant security interests in the maritime domain. With the longest coastline in the world, the country is surrounded by three oceans (Arctic, Atlantic and Pacific) and possesses one of the world’s biggest inland waterways (Great Lakes and St. Lawrence River). Canada’s maritime jurisdiction – including its Exclusive Economic Zone (EEZ) and extended continental shelf – covers an area of more than 7 million square

35 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Lieutenant-General George Macdonald).

36 Document prepared by Frank P. Harvey and distributed to the House of Commons Standing Committee on National Defence on 9 May 2014.

37 NATO, [“Ballistic Missile Defence,”](#) 20 January 2015.

38 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson).

39 Ibid.

kilometres and provides an abundance of oil, gas, mineral, fish and other resources. Canada is also one of the major trading nations of the world and relies heavily on maritime trade. Most of what Canadians import and export overseas are shipped by way of the ocean trade routes.⁴⁰ Indeed, about 90% of world trade activities depend on sea transportation.⁴¹ The sea lanes essentially serve as global highways for Canadian products and Canadian ports as the gateways to global economies. “On any given day one-third of the inventory of enterprises like Canadian Tire is at sea,” Colin Robertson told the Committee, adding that Canadian raw resources such as potash and pulses, for example, are shipped to between 100 and 150 markets worldwide.⁴² Given the dependence on sea lanes for commerce, it is imperative that Canada’s maritime interests be protected.

While the threat of naval confrontation with another country appears remote, Canada faces a number of non-military threats in the maritime domain. Asked to identify the greatest maritime threat to Canada, Rear-Admiral John Newton, Commander of Maritime Forces Atlantic and Joint Task Force Atlantic, responded that it was “just knowing what is happening in Canada’s ocean areas of interest” from a shipping and maritime navigation standpoint.

Our ocean areas of interest are not defined by territorial seas or economic exclusion zones or even the enlarged shelf, it is the sea lanes that approach from everywhere around the world. The global economy floats on salt water. It is actually a truism that everything we buy and sell, resources, are marketed across the sea. Having an understanding of those massive volumes of ship movements ... is of great importance ... These are the same vectors by which terrorism could penetrate our country if we don’t monitor and track the shipping and understand the shipping intent.⁴³

The threat of maritime terrorism must also be considered from a national security perspective. Terrorist attacks in the maritime environment are increasing around the world and Canada is certainly not immune. A potential terrorist attack on merchant ships, tankers or offshore oil facilities in Canadian waters or against key port facilities such as those of Halifax, Montreal or Vancouver could cause serious loss of life, undermine the country’s trade, paralyze the economy, and even result in a temporary shutdown of borders. There is also the possibility that ships could be used to import chemicals, explosives and other illegal materials into Canada, which could then be used to conduct terrorist attacks against North American infrastructures and populations. Rear-Admiral Newton stated:

The principal threat from non-state actors is the use of the sea lanes—the big-box traffic that comes in thousands of containers per ship and the importation of illicit cargoes.

40 Fisheries and Oceans Canada, [“Canada’s Ocean Estate: A Description of Canada’s Maritime Zones”](#) and [“Ocean Industries: A Growing Part of Canada’s Economy”](#); Transport Canada, [Transportation in Canada 2013](#), 2014, pp. 6-7, 14-17.

41 Transport Canada, [“Maritime Commerce Resilience.”](#)

42 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson).

43 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 February 2015 (Rear-Admiral John Newton).

They could be arms, explosives, precursor chemicals; they could be drugs. I would say that right now the most prevalent cargo threatening Canada is drugs.⁴⁴

In addition, Canada monitors foreign naval movements and activities in the maritime domain. Although the country faces no imminent threat from foreign naval forces, there remains a requirement to “monitor the intent of foreign government ships, which often have military nexus to their activities,” as Rear-Admiral Newton informed the Committee. There is also a requirement to track foreign submarine activities. More and more countries are acquiring submarines, whose stealthy capabilities are not only used for undersea warfare, but also for special operations and intelligence, surveillance and reconnaissance (ISR) purposes. Rear-Admiral Newton informed the Committee that “the naval menace [from state actors] on the seas clearly is foreign submarine fleets, should those countries that own them become adversarial to Canada’s national interest.”⁴⁵

D. Arctic Threats

The security and defence of Canada’s Arctic territory has been a shifting priority of the CAF for decades. Militarization of the Canadian North was initiated during the Second World War and intensified during the Cold War as the threat of military confrontation with the Soviet Union and the need to protect North America from possible enemy airborne and seaborne attacks by way of the Arctic gained importance. With the end of the Cold War, however, the focus on Arctic security and defence diminished.

Today, Canada faces a very different world. A new and challenging international security environment has emerged and climate change is opening up the Arctic to sea navigation and resource exploitation sooner than most scientists expected. The region is again of considerable geostrategic interest and is no longer regarded as the sole domain of the littoral Arctic states (Canada, Denmark, Norway, Russia and the United States). Indeed, countries such as China, those of the European Union and several others are approaching the Arctic region with a view for opportunity. It is estimated that within the next few decades, melting of ice in the Arctic will provide access to a wealth of untapped raw materials and will open up new maritime trade routes. Although Canada faces no imminent military threat in the Arctic, increased human and commercial activity in the region will create greater emergency risks.⁴⁶

Almost all witnesses referenced potential security threats and emerging challenges in the Arctic. They pointed to environmental concerns such as air and maritime pollution and the effect of climate change and the melting of the polar ice on the Arctic region; to increase in military and commercial traffic, in particular aircraft, ships and submarines; to industrial exploitation of natural resources, such as diamonds, oil and gas; to a possible rise in unlawful activities such as illegal migration and human trafficking, arms and drugs

44 Ibid.

45 Ibid.

46 P. Whitney Lackenbauer, “Canadian Security and Safety in the Arctic: Probable Challenges, Practical Responsibilities,” *Canadian Naval Review*, Vol. 10, No. 2 (2014), pp. 10-15; Natalie Mychajlyszyn, [The Arctic: Canadian Security and Defence](#), PRB 08-13E (InfoSeries), Parliamentary Information and Research Service, Library of Parliament, Ottawa, 24 October 2008, pp. 1–5.

smuggling and terrorism in the region; to the outbreak of widespread diseases; to natural disasters; to infringements on Canadian sovereignty; and to various other security threats and concerns. It may also lead to an increase in search and rescue related incidents due to extreme weather to which Canada may be asked to respond. Witnesses also noted that security in the Arctic is complicated by the geography and harsh climate of the region.⁴⁷

Moreover, competing claims and interests between states could potentially lead to tensions in the region. Some commentators maintain that there is a real prospect for political conflict and military competition given the estimated value of Arctic resources. The growing military importance of a changing Arctic environment has already led the five littoral states to move to strengthen the capabilities of their armed forces to operate in the Arctic and to conduct a growing number of military manoeuvres in the region in recent years.⁴⁸

That said, most witnesses agreed that Canada faces no immediate military threat in the Arctic. Professor Whitney Lackenbauer of St. Jerome's University does not believe that there is an Arctic arms race that is likely to deteriorate into military conflict.⁴⁹ Professor Elinor Sloan of Carleton University suggested that "the issue we will have in the Arctic in the coming years and decades will not be primarily a warfare one," but rather "the threat will be largely emergency management in nature, perhaps an oil spill, a cruise ship or container ship that gets caught in the ice, or a terrorist or criminal smuggling situation demands a law enforcement response."⁵⁰

It should be noted that despite the deterioration of Canadian diplomatic relations with Russia over the ongoing crisis in Ukraine and the illegal occupation and annexation of Crimea, witnesses did not regard Russia as a direct military threat in the Arctic. "I do not think there is a military threat to the Arctic," though there "might be points of friction," George Petrolekas said.⁵¹ He expanded on this point:

Irrespective of the things that occur in Europe ... we still share space in the Arctic ... I don't see the Russian hordes advancing across the Arctic to attack ... It is a very inhospitable environment, I really just don't see a clear and present danger from a military standpoint.⁵²

47 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare and Brigadier-General G.D. Loos); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

48 Dylan Lee Lehrke, "The Cold Thaw," *Jane's Defence Weekly*, Vol. 51, No. 20 (14 May 2014), pp. 24–29; Ernie Regehr, [Circumpolar Military Facilities of the Arctic Five](#), The Simons Foundation, 2 April 2013, pp. 1–40; Frederic Lasserre, Jerome Le Roy and Richard Garon, "Is There an Arms Race in the Arctic?," *Journal of Military and Strategic Studies*, Vol. 14, No. 3&4 (2012), pp. 1–56; Siemon T. Wezeman, "[SIPRI Background Paper: Military Capabilities in the Arctic](#)," SIPRI, March 2012, pp. 1–15; Gerrard Cowan, "Polar Scares," *Jane's Defence Weekly*, Vol. 47, No. 12 (24 March 2010), pp. 22–27; Mark Galeotti, "Cold Calling: Competition Heats Up for Arctic Resources," *Jane's Intelligence Review*, Vol. 20, October 2008, pp. 8–15.

49 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 December 2014 (Whitney Lackenbauer).

50 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

51 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (George Petrolekas).

52 Ibid.

His CDAI colleague Ferry de Kerckhove held a similar view, arguing that the Arctic is “an area where there is no choice but to cooperate,” such as in the field of search and rescue. He stated that:

There is no area to be claimed for the Russians [in the Arctic] and the Russians control an overwhelming majority of the whole area. It is not ... an expansionary place where you would want to make mischief ... The Arctic is not an area where you want to have a problem with your neighbours.⁵³

Similar opinions were expressed by Professors Stephen Saideman of Carleton University, Alexander Moens of Simon Fraser University, and Stéphane Roussel of the École nationale d'administration publique.⁵⁴

Nevertheless, many witnesses have expressed specific concern with increased Russian military activities in the Arctic since Russia is currently bolstering its military capabilities, which includes building new airbases and stationing additional troops in its polar regions as well as expanding the size of its Northern Fleet and rebuilding its submarine capabilities. It is also conducting larger and ever more complex military exercises in the region and has drastically increased the activities of its military aviation in the Arctic in recent years.⁵⁵ According to Major-General Wheeler, the Russian Air Force is now more active in the Arctic than it has ever been since the fall of the Soviet Union and the end of the Cold War.⁵⁶

Professor Rob Huebert of the University of Calgary also cautioned the Committee about the ongoing militarization of the Arctic region and how this could lead to armed confrontation in the future.⁵⁷ Lieutenant-General Parent said that while there does not appear to be at the moment any “intent of armed conflict in the Arctic, of Russia against North America,” that intent could “change very rapidly.” As a case in point, he alluded to the fact that Russia invaded Crimea only a few days after hosting the Olympic Games in Sochi in 2014.⁵⁸

E. Cyber Threats

Canada also faces growing security threats from cyber space. The cyber environment has evolved extremely rapidly in recent years, as Rafal Rohozinski, principal of the SecDev Group, informed the Committee:

53 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (Ferry de Kerckhove).

54 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 1 May 2014 (Stephen Saideman and Alexander Moens); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 29 April 2014 (Stéphane Roussel).

55 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 December 2014 (Robert Huebert); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Lieutenant-General George Macdonald).

56 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

57 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 December 2014 (Robert Huebert).

58 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

Twenty-five years ago there were perhaps 14,000 people connected to the Internet. Today over a third of humanity is connected to broadband Internet and there are more cellphones on the planet than there are human beings. This has a significant and profound impact on all of our societies. Our dependence on digital technologies and networks has expanded faster than our ability to design rules and regulations or adapt existing laws and practices to this new environment.⁵⁹

With this rapid technological progress have come new forms of threats. Cyber criminality, cyber hacking, cyber espionage and cyber terrorism – threats that basically did not exist a quarter of a century ago – are now threatening our very way of life. The absence of international control and regulation of the cyber world makes it all the more difficult for law enforcement and judicial organizations worldwide to track down and prosecute perpetrators.⁶⁰ Mr. Rohozinski stated that cyber threats pose a direct threat to Canadian national security:

If Canada is a country that was forged by the iron rail, today Canada's economy is held together by the glass fibres of the digital web ... Commerce, governance, as well as everyday life, are dependent on telecommunications and the internet. In this respect cyber space is a national strategic asset whose disruption or vulnerability to disruption represents a significant risk to national security far greater than that of other physical threats to economic and territorial integrity ... The risks and threats are not just to cyber space, but what cyber space enables, including critical infrastructure and important access to knowledge including genetic, biological, and other areas of science, which in themselves represent unique and important risks to our increasingly complex and technologically dependent societies.⁶¹

“The reality is that our systems are very vulnerable” because security was “never at the heart of how these systems were engineered to begin with,” and “we haven't put in those kinds of regulatory demands to ensure that operators of critical infrastructure take security not just as a responsibility to their shareholders ... but also as part of their responsibility to Canada ... or to national security.” This, Mr. Rohozinski said, is the “principal failure we have.”⁶²

Cyber attacks could be used to physically cripple critical infrastructures or to manipulate information as to make it unreliable or even foster a failure of systems. “Shut down our electrical grid system,” said Colin Robertson, “and you risk the shutdown not just of Canada but the United States.”⁶³

The cyber threat is in constant evolution. More and more states and non-state actors are, in fact, developing offensive cyber capabilities that they can use both in peacetime or wartime. According to Mr. Rohozinski, the main reason lies with the fact that cyber warfare “lowers the threshold for being able to compete at a military [and] political

59 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Rafal Rohozinski).

60 Ibid.

61 Ibid.

62 Ibid.

63 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson).

level that previously required an investment in manned materiel technique that was really reserved only for the most advanced countries.”⁶⁴

Brian Bow, a Fellow with the CDFAI, told the Committee that the cyber threat “is something that is a continual evolution. For every measure you undertake, a countermeasure can readily be developed to respond to it ... It's the kind of thing that requires an enormous and/or costly continuous effort to respond to.”⁶⁵ Colin Robertson said cyber has now emerged as the fifth domain of warfare together with air, land, sea and space.⁶⁶

F. Terrorist Threats

Some witnesses also spoke about the threat of terrorism. Although references to terrorism have already been made in the aerial, maritime, Arctic, and cyber threats sections of this report, the Committee still felt it should be looked at specifically as an emerging threat. Since the 11 September 2001 terrorist attacks on the U.S., terrorist threats have been of growing concern to American and Canadian authorities. Lieutenant-General Parent stated that threats from terrorist organizations have “by no means evaporated.” With growing collusion between terrorists and transnational criminal organization involved in weapons, drugs and human trafficking, Lieutenant-General Parent argued that there is a “growing opportunity for terrorists to use modern weapons such as cruise or even short-range ballistic missiles launched from shipping containers” or to deliver “weapons of mass destruction from unmanned aerial vehicles or general aviation aircraft.” Moreover, there is also the possibility of attacks launched by homegrown violent extremists and terrorists, for which there is “usually little intelligence or warning.”⁶⁷ As the 22 October 2014 terrorist attack on Canada’s Parliament Hill illustrates, the threat from terrorism is real and can strike when least expected.

According to Major-General Christopher Coates, Deputy Commander (Continental) of Canadian Joint Operations Command (CJOC), “the most likely threat in Canada” is nothing new and comes from Toxic Industrial Materials, or TIMs. A terrorist attack that would release toxic chemicals or other TIMs into the air or into food or water supplies, for example, could cause mass casualties and destruction, either from direct or indirect exposure to those hazardous substances. “Exposure” to TIMs “is the most likely threat that could affect Canadians domestically in a CBRN [Chemical, Biological, Radiological and Nuclear] sense,” said Major-General Coates.⁶⁸

Paul Stockton, former U.S. Assistant Secretary of Defense for Homeland Defense and America’s Security Affairs (2009–2013), stated that a terrorist attack on Canadian and American critical infrastructures could have disastrous consequences across North

64 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Rafal Rohozinski).

65 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Brian Bow).

66 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson).

67 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

68 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

America. An attack on the electric power network of Canada and the U.S. could cause lengthy power outages and affect other vital systems that rely on electricity to function, such as fuel and water infrastructures. “The water system is utterly dependent on electricity in order to function and in order to pump the waters,” Mr. Stockton stated. “With no electricity, no water for drinking, no water for firefighting, everything else is in jeopardy.”⁶⁹

DEFENDING CANADA

A. The Canadian Armed Forces and the Defence of Canada

The defence of Canada is the number one mission of the CAF. Lieutenant-General Stuart Beare, Commander of CJOC, told the Committee that “the home front is our core mission.”⁷⁰

We not only provide first line military defence, but we also have an important role ... in providing for the safety and security of Canadians as we support our federal and provincial partners in their mandate to deliver on safety and security missions.⁷¹

The Committee was told that the CAF maintains a high state of readiness and the men and women of the Canadian Army, the RCN and the RCAF all stand ready to defend Canada 24 hours per day, 365 days per year.

The following section of the report looks at key responsibilities of the CAF in the defence of Canada, which includes maintaining domain awareness and operational readiness as well as providing disaster relief and military aid to the civilian authorities, conducting search and rescue, and contributing to Arctic security.

1. Domain Awareness

Central to the defence of Canada is the ability of the armed forces to maintain situational awareness of our country’s air, maritime, land and space domains. Domain awareness is a “key priority,” according to George Petrolekas. “If you don’t see what’s going on in your territory, how do you know you have a problem?” he said, it is not just about detecting hostile foreign activities in Canada’s airspace, waters or even in the Arctic; domain awareness is also about such things as search and rescue, fisheries protection, and environmental monitoring.⁷² Fundamentally, it is about surveillance and the detection of threats.

Domain awareness in Canada is achieved through the use of a wide range of different assets and technologies, which include aircraft, ships, satellites, radars, sensors, and other systems. It is a “system of systems.”⁷³ It is also achieved through a whole-of-

69 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 6 May 2014 (Paul Stockton).

70 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare).

71 Ibid.

72 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (George Petrolekas).

73 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare).

government approach that involves personnel and resources from various federal government departments and agencies, not just the CAF and DND. It also involves the U.S. through NORAD and other bilateral defence and security arrangements. Lieutenant-General Beare stated:

Domain awareness is delivering and it's an effort that is civilian and military. It's space-based, airborne and surface. It's also bilateral, bi-national, with the Americans ... Our response to the requirements for safety and security at sea are delivered by the military, civilians, coast guard and others. It is working and is delivering. You see it in airborne maritime safety and security efforts routinely.⁷⁴

An important example of Canada's whole-of-government, system of systems approach to domain awareness can be found in the maritime realm. Canada's three interdepartmental Marine Security Operations Centres (MSOCs) monitor marine activities and potential threats to Canada's East and West Coasts and the Great Lakes–St Lawrence Seaway. Located in Halifax, Nova Scotia; Victoria, British Columbia; and Niagara, Ontario, MSOCs are operational 24/7 and are staffed by personnel from the CAF and DND as well as the Canada Border Services Agency (CBSA), the Canadian Coast Guard, Fisheries and Oceans Canada, the Royal Canadian Mounted Police (RCMP) and Transport Canada. The MSOCs monitor the thousands of “targets” that operate in Canadian waters each day with the help of information supplied by aircraft, ships, satellites, radars, and other technologies.⁷⁵

Maritime domain awareness and security also involves cooperation and information sharing with NORAD, which, as mentioned earlier, has had a maritime warning role since 2006. Domain awareness mechanisms also involve support from various American organizations, such as the U.S. Coast Guard, the U.S. Navy, and the U.S. Department of Homeland Security. It also includes collaboration and exchanges of intelligence with other foreign governments and international organizations, such as the Greenland government, Interpol and NATO.⁷⁶

Maritime domain awareness in Canada is an example of a “layered approach.” “Today I don't feel any inadequacy in our capacity to understand what's going on in our maritime domain,” Lieutenant-General Beare told the Committee.⁷⁷

Monitoring our air and space domains entails a similar whole-of-government, system of systems approach, as we have already mentioned in the NORAD section of our report. And as will be seen later, land domain awareness involves the participation of a wide range of federal, provincial and territorial government partners and resources, such as in the Arctic.

74 Ibid.

75 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 February 2015 (Rear-Admiral John Newton); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Nadia Bouffard). See also Government of Canada, “[Marine Security Operations Centres Project](#).”

76 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 February 2015 (Rear-Admiral John Newton); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Nadia Bouffard).

77 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare).

2. Operational Readiness

In the CAF, the Canadian Army, the RCN and the RCAF can be referred to as “force generators.” They are largely responsible for organizing, training and equipping forces – Regular Force and Reserve Force – for employment by the operational commands of the CAF, which include CJOC and Canadian Special Operations Forces Command (CANSOFCOM). As “force employers,” the operational commands are responsible for planning, executing and reviewing all CAF operations at home and abroad.⁷⁸

Established in October 2012, CJOC replaced Canada Command, Canadian Expeditionary Force Command (CEFCOM) and Canadian Operational Support Command (CANOSCOM). It integrates the functions of these three former commands into a single operational command.⁷⁹ CJOC is “responsible for conducting full-spectrum Canadian Armed Forces operations at home, on the continent of North America, and around the world.” It “directs these operations from their earliest planning stages through to mission closeout, and ensures that national strategic goals are achieved.” According to DND, “the only Canadian Armed Forces operations in which CJOC does not engage are those conducted solely by ... CANSOFCOM or NORAD.”⁸⁰

CJOC oversees six sub-commands known as regional Joint Task Forces, which are strategically located across Canada. They provide command and control to military task forces deployed on operations in Canada. Joint Task Force (North) is responsible for the Yukon, the Northwest Territories and Nunavut; Joint Task Force (Pacific) for British Columbia, Joint Task Force (West) for Alberta, Saskatchewan and Manitoba; Joint Task Force (Central) for Ontario; Joint Task Force (East) for Quebec; and Joint Task Force (Atlantic) for New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador.⁸¹

CJOC, the Committee was told, stands ready to respond to any emergency situation anywhere in Canada or North America. “We’re always operating and we’re always ready,” Major-General Coates said. “The command and control apparatus is at the highest level of readiness at all times.”⁸² CJOC maintains direct connections with military and civilian emergency centres across Canada, which facilitates responses to crises.

CJOC regularly works in partnership with a broad range of domestic partners, which include Public Safety Canada, the CBSA, the Canadian Coast Guard, Environment Canada, Fisheries and Ocean Canada, the Royal Canadian Mounted Police (RCMP), as well as various provincial and territorial government organizations.⁸³ Moreover, as

78 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

79 DND, “[Canadian Joint Operations Command Stood-Up in Ottawa](#),” 5 October 2012.

80 DND, “[Canadian Joint Operations Command](#).”

81 DND, “[Regional Joint Task Forces](#).”

82 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

83 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare).

mentioned earlier in this report, CJOC maintains a “very active relationship” with NORAD and USNORTHCOM through the Tri-Command structure.⁸⁴

Major-General Coates expressed confidence in CJOC’s capability to respond quickly, owing to the high state of readiness of the “assets and resources and capabilities” provided to it by the Canadian Army, the RCN and the RCAF. As he elaborated:

Our ability to meet all of our readiness requirements—whether they're in search and rescue or the domestic forces that are in readiness, the immediate reaction units, our ready duty ships, or the aircrafts that are standing by on the coasts in order to respond to surveillance requirements—we monitor that on a daily basis. Outside of an occasional once or twice perhaps every six months where an aircraft has a servicing problem, which doesn't strike me as that abnormal, we're always green every morning.⁸⁵

3. Naval Readiness

The RCN currently consists of about 30 warships (Iroquois class destroyers, Halifax class frigates, Victoria class submarines, and Kingston class maritime coastal defence vessels) and various training and auxiliary vessels. These ships operate from two naval bases located in Halifax in Nova Scotia and Esquimalt in British Columbia. There are also 24 Naval Reserve Divisions located across Canada.⁸⁶

The RCN is currently undergoing one of its most important recapitalization program in its post-Second World War history. In recent years, the Government of Canada has announced a number of major defence procurement projects to renew and modernize the RCN fleet. These projects entail the acquisition of more than 20 new naval vessels in coming years, all of which will be constructed in Canada through the National Shipbuilding Procurement Strategy.

“All three of the major [RCN] shipbuilding projects are right now in funded project definition,” Vice-Admiral Norman told the Committee. He said that the RCN is looking “forward to seeing steel cut on the [six] Harry DeWolf class Arctic Offshore Patrol Ships in mid-2015” to be “followed by the [two] Queenston class Joint Support Ships, and in the longer term the [fifteen] Canadian Surface Combatants.”⁸⁷ According to DND, it is anticipated that the Arctic/Offshore Patrol Ships will be delivered between 2018 and 2023, the Joint Support Ships between 2019 and 2020, and the Canadian Surface Combatants between 2025 and 2042.⁸⁸ According to Vice-Admiral Norman, “these programs, along with the modernized [CP-140] Aurora maritime patrol aircraft, and the new [CH-148]

84 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

85 Ibid.

86 DND, [“Royal Canadian Navy: Fleet and Units”](#) and [“Royal Canadian Navy: Structure of the RCN.”](#)

87 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 18 November 2014 (Vice-Admiral Mark Norman).

88 DND, [“Section III: Supplementary Information – Status Report on Transformational and Major Crown Projects.”](#) *Report on Plans and Priorities 2015–16*; DND, [“Naval Systems.”](#) *Defence Acquisition Guide 2015*.

Cyclone maritime helicopter, which will soon be integrated into fleet service, will truly take the RCN to the next level of overall war-fighting capabilities.”⁸⁹

In the meantime, work is progressing with the modernization and life-extension of the navy’s 12 Halifax class frigates. Rear-Admiral Newton told the Committee that the first modernized frigate to deploy on operation did so in December 2014. This was HMCS *Fredericton*. It recently operated in the Mediterranean Sea with other NATO naval assets under Operation REASSURANCE, Canada’s support to NATO assurance measures in Eastern and Central Europe in response to the recent Russian aggression in Ukraine. Three other frigates have been modernized at Irving Shipbuilding, Rear-Admiral Newton said, and “their readiness is building quickly, each available for tasking to some degree or another.”⁹⁰ The last of the 12 modernized frigates is expected to be operational by 2018.⁹¹ The new technology inserted in those modernized warships, Rear-Admiral Newton said, will provide the navy with “more capability than [it] had in the older systems.”⁹² Also, all four Victoria class submarines have undergone modernization and life-extension in recent years.⁹³

“We have not seen the degree of recapitalization in terms of its broad impact on the fleet since the Korean War,” Vice-Admiral Norman stated. “We have not engaged in such a widespread recapitalization since that time” and all of this is “happening over a relatively short period of time.” The current recapitalization efforts, he said, really entail “two decades of continuous transition” for the navy, as existing ships are modernized, old ones retired, and new ones enter service. “In non-wartime, we’ve never seen anything like this.”⁹⁴

The recapitalization process is inadvertently putting pressure on the navy and raising concerns about the risks of reduced fleet capability in coming years. The September 2014 DND decision to prematurely retire the destroyers HMCS *Iroquois* and *Algonquin* and the support ships HMCS *Protecteur* and *Preserver* starting in 2015 is expected to “generate some loss in both capacity and capability for the RCN,” as DND admits.⁹⁵ This was confirmed by Vice-Admiral Norman, who told the Committee that the retirement of those support ships and destroyers will create gaps in command and control, air defence and at-sea replenishment capabilities.⁹⁶ However, he stated that the navy is “looking at a range of options” to close those gaps, including partnerships with “allies that can provide some short-term relief” and, in the case of the support ships, the “possibility of

89 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 18 November 2014 (Vice-Admiral Mark Norman).

90 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 February 2015 (Rear-Admiral John Newton).

91 DND, “[Section III: Supplementary Information – Status Report on Transformational and Major Crown Projects](#),” *Report on Plans and Priorities 2015–16*.

92 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 February 2015 (Rear-Admiral John Newton).

93 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 18 November 2014 (Vice-Admiral Mark Norman).

94 Ibid.

95 DND, “[Royal Canadian Navy's Transition to the Future Fleet](#),” 19 September 2014.

96 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 18 November 2014 (Vice-Admiral Mark Norman).

some commercial options that may be able to give us longer and more predictable access to a capability.”⁹⁷

Vice-Admiral Norman said that the RCN has devised and is currently implementing an executive plan to help it “navigate” through its “most intensive and comprehensive institutional renewal in half a century.” As part of this plan, the navy is “evolving [its] governance structures, [its] training systems, and [its] ship crewing models,” among other things. He said the navy has already made “great progress” in executing that plan and that, as a result, it is emerging as a “smarter, more efficient, and more focused organization.”⁹⁸

In spite of the challenges of recapitalization, Vice-Admiral Norman is confident that the RCN will “continue to deliver effect at seas and ashore for Canadians” for years to come, thanks to the high professionalism of its sailors and the “effectiveness of [its] modernized frigates, [its] submarines, and [its] coastal defence vessels.”⁹⁹

Rear-Admiral Newton said “our efforts in generating operational readiness are focused on maintaining a Canadian naval task group at high readiness, combining elements of the east and west coast fleets to sustain a rapidly deployable, logistically supported, and agile force capable of undertaking a broad range of defence and security tasks” at home or abroad.¹⁰⁰

Canadian warships regularly train and conduct sovereignty patrols in Canada’s Atlantic, Pacific and Arctic maritime domains. They also partake in fisheries patrols and counter-narcotics operations in Canadian waters in cooperation with Fisheries and Oceans Canada and the RCMP. The RCN also frequently works with the Canadian Coast Guard “on everything, from counter-narcotics to search and rescue to routine surveillance,” as Vice-Admiral Norman informed the Committee.¹⁰¹ In the Arctic, for example, the navy and the coast guard conduct maritime security exercises together. They also conduct various joint maritime security and search and rescue operations.¹⁰²

The Committee also heard about the “very strong bilateral relationship” that exists between the navies of Canada and the U.S. and how this contributes to maritime security in North America. The RCN’s Atlantic and Pacific fleets regularly train, share information and exchange personnel with the U.S. Navy and the U.S. Coast Guard. They have also “joined forces with the U.S. fleet forces” on countless occasions in North American waters.

97 Ibid.

98 Ibid.

99 Ibid.

100 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 February 2015 (Rear-Admiral John Newton).

101 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 18 November 2014 (Vice-Admiral Mark Norman).

102 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Nadia Bouffard).

The RCN also partakes in series of joint binational naval exercises that focus specifically on the defence of North America.¹⁰³

4. Aerial Readiness

The Committee also obtained testimony on the state of readiness of the RCAF and its ability to respond to threats in the air domain. The RCAF currently consists of 14 Wings spread across Canada: 1 Wing in Kingston, Ontario; 2 Wing and 3 Wing in Bagotville, Quebec; 4 Wing in Cold Lake, Alberta; 5 Wing in Goose Bay, Newfoundland and Labrador; 8 Wing in Trenton, Ontario; 9 Wing in Gander, Newfoundland and Labrador; 12 Wing in Shearwater, Nova Scotia; 14 Wing in Greenwood, Nova Scotia; 15 Wing in Moose Jaw, Saskatchewan; 16 Wing in Borden, Ontario; 17 Wing in Winnipeg, Manitoba; 19 Wing in Comox, British Columbia; and 22 Wing in North Bay, Ontario. The RCAF operates a fleet of more than 380 aircraft and helicopters.¹⁰⁴ Several RCAF witnesses appeared before the Committee, each expressing confidence in the capability of the air force to rapidly respond to any domestic crisis or emergency situation.

Committee members heard about the acquisition of new aircraft fleets in recent years and its impact on the RCAF. The acquisition of CC-177 Globemaster III strategic transport aircraft and the CC-130J Super Hercules tactical transport aircraft as well as the modernization of the CF-18 Hornet jet fighters in recent years has enhanced the capabilities of the air force.¹⁰⁵ Major-General Wheeler told the Committee:

When we added that mid-life upgrade, it brought that aircraft [CF-18] back into comparison with the rest of the front-line aircraft, interoperable with our main allies and certainly extremely capable. We're very happy with that. Of course, at the end of the day, like any other machine, it will need to be replaced, but right now, we're very comfortable with where we sit with the capabilities that the Hornet provides.¹⁰⁶

In the same vein, Colonel David W. Lowthian, Commander of 8 Wing Trenton, spoke about the unique capabilities of the CC-177 and how the introduction of that aircraft has transformed the RCAF's airlift capabilities and what it can bring to military operations both at home and abroad.

There are four elements to the strategic airlift capability that the C-17 [CC-177] brings ... to Canada as a whole: responsiveness, relevance, reliability, and reach ... In a

103 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 February 2015 (Rear-Admiral John Newton).

104 This includes 77 CF-18 Hornet fighters, 18 CP-140 Aurora patrol aircraft, 85 CH-146 Griffon and 15 CH-147 Chinook tactical helicopters; 27 CH-124 Sea King maritime helicopters, 14 CH-149 Cormorant search and rescue helicopters, 5 CC-177 Globemaster III strategic transports, 17 CC-130J Super Hercules and 23 CC-130 Hercules tactical transports, 5 CC-150 Polaris tankers and transports, 6 CC-144 Challenger executive jets, 6 CC-115 Buffalo search and rescue aircraft, 4 CC-138 Twin Otter utility transports, 4 CT-142 Dash-8, 16 CT-155 Hawk, and 25 CT-156 Harvard II training aircraft, 13 CH-139 Jet Ranger training helicopters, and the 24 CT-114 Tutor air demonstration jets of the Snowbirds. DND, "[Royal Canadian Air Force: Aircraft](#)" and "[Wings and Squadrons](#)."

105 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Colonel David W. Lowthian); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler and Colonel Sylvain Ménard).

106 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

responsive manner, it can leave when we're told and when we need it to. We don't have to lease that capability anymore. In regard to relevance, with the size of loads that it can carry, whether it's for a humanitarian cause or to support our troops deployed on a combat mission, we're getting in volume the equipment they require. Also, when there's outsized cargo, etc., we know that we can bring it. On reliability, this capability is more than just an aircraft. It comes with a global sustainment and support partnership with other services that fly this aircraft, with Boeing. Last is its reach. With the distances it can fly and the speeds at which it can fly, we know that we can build air bridges ... in really no other way.¹⁰⁷

Both Colonel Lowthian and Colonel Sylvain Ménard, Commander of 3 Wing Bagotville, told to the Committee how their respective Wings – using those above-mentioned aircraft as well as others – contribute to the defence of North America from a fighter and air transport perspective.¹⁰⁸

Canada possesses two fighter Wings: 3 Wing in Bagotville, Quebec, and 4 Wing in Cold Lake, Alberta. 3 Wing is home to 425 Tactical Fighter Squadron and its fleet of 27 CF-18 jet fighters. While 3 Wing stands ready to provide combat capable forces for international operations, its main focus is its core mission of defending Canada and North America through NORAD. Colonel Ménard stated that the “NORAD mission is 3 Wing’s priority ... [it’s] reason for being.”¹⁰⁹ 3 Wing’s main area of responsibility is the eastern portion of Canada. 4 Wing, on the other hand, is responsible for the western portion. That said, Major-General Wheeler pointed out that both Wings extensively cooperate in defending Canada.¹¹⁰ “The fighter force in Canada is not a large entity,” Colonel Ménard emphasized, therefore “we work together to make sure we fulfill our missions abroad and domestically, on the NORAD front, and to make sure we minimize the impact on both fighter wings of any deployments.”¹¹¹

With regards to air transport, 8 Wing Trenton is the “hub of Canada’s air mobility operations,” according to Colonel Lowthian.¹¹² It is where the RCAF fleet of strategic and tactical transport aircraft is stationed. This includes, among others, the 5 CC-177 Globemasters III of 429 Squadron, the 17 CC-130J Super Hercules of 436 Squadron, and the 5 CC-150 Polaris of 437 Squadron. 8 Wing provides essential airlift support to CAF operations at home and abroad, making it “more or less the airlift gateway to all operations.”¹¹³ Whenever military personnel and supplies are airlifted across Canada on domestic operations, such as disaster relief, it is generally achieved using 8 Wing air assets.

107 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Colonel David W. Lowthian).

108 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Colonel David W. Lowthian); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Colonel Sylvain Ménard).

109 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Colonel Sylvain Ménard).

110 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

111 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Colonel Sylvain Ménard).

112 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Colonel David W. Lowthian).

113 Ibid.

In addition, 8 Wing aircraft are often engaged in the Arctic and provide support to NORAD. Its CC-177 and CC-130J transport aircraft routinely airlift military personnel, equipment and supplies to the North. This includes resupplying CF-18 Forward Operating Locations in the Arctic as well as Canadian Forces Station (CFS) Alert, a signals intelligence station situated on the northern tip of Ellesmere Island. CFS Alert is Canada's northern most inhabited location in the North. In addition, CC-150 aircraft often provide air-to-air refuelling to CF-18s engaged on long-range NORAD operations in northern Canada.¹¹⁴

8 Wing Trenton, the Committee heard, is vital to the CAF's expeditionary capabilities. Its aircraft help the CAF bridge what Lieutenant-General Parent calls the "tyranny of the distances in Canada." He said that "a lot of people don't know that there's more distance between the southern edge of Canada and the northern edge of Canada than there is east to west ... Going to the north is our biggest challenge in terms of distance."¹¹⁵ The distance between Toronto and CFS Alert, for example, is 4,344 km.¹¹⁶ In short, several witnesses compared CAF deployments to the Arctic as having the same logistical challenges as expeditionary operations abroad.¹¹⁷

The RCAF conducts a wide range of other missions domestically. For example, its modernized CP-140 Aurora patrol aircraft are routinely engaged in sovereignty and maritime air patrols, which includes watching for illegal fishing, drug smuggling, polluters and illegal immigration. Its CH-124 Sea Kings maritime helicopters regularly deploy from the decks of RCN warships on naval operations and will be replaced by the new CH-148 Cyclones. Its CH-146 Griffon tactical helicopters provide daily support to the Canadian Army and will be joined in the field by the new CH-147 Chinooks once that fleet becomes fully operational. The RCAF search and rescue fleets of CH-149 Cormorant and CH-146 Griffon helicopters and CC-115 Buffalo, CC-130 Hercules, and CC-138 Twin Otter aircraft regularly partake in search and rescue operations across Canada.¹¹⁸

5. Disaster Relief and Military Aid to Civilian Authorities

As part of their mandate, the CAF stand ready to provide aid to the civil authorities in the event of natural or man-made disasters or other national emergencies. When he testified before the Committee, Lieutenant-General Beare suggested that "in terms of the defence mission in the homeland ... the perennial and persisting challenges include natural disasters and the requirement to provide for the safety and security of Canadians

114 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Colonel David W. Lowthian); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

115 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

116 DND, "[Canadian Forces Station Alert](#)."

117 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (Ferry de Kerckhove).

118 DND, "[Royal Canadian Air Force: Overview](#)."

in the face of natural disasters and man-made disaster, be they accidental or deliberate, in particular when it comes to hazardous materials.” It is a daily preoccupation of CJOC.¹¹⁹

When disaster strikes, it is the civilian authorities that lead relief efforts. CAF deployments in support of civilian authorities are normally measures of “last resort.” They usually occur at the official request of the civilian authorities. However, the CAF can “rapidly surge resources and unique capabilities at critical moments to complement and enhance the resources of ... civilian partners,” according to Major-General Coates.¹²⁰

Whole-of-government planning is essential to the success of military aid to civilian authorities and disaster relief operations. The CAF maintains regular contact with Public Safety Canada – the lead federal government organization when it comes to emergency response – and other federal partners as well as provincial and territorial governments to ensure civil decision makers have “realistic expectations of CAF capabilities, limitations and deployment times.”¹²¹

In order to be as efficient and effective as possible, the CAF has developed a contingency plan for the provision of humanitarian and disaster relief support to provincial and territorial authorities during a major disaster; it is known as Operation LENTUS.¹²² Major-General Coates explained how it functions to the Committee:

Under Operation LENTUS, the Canadian Armed Forces' intent is to have strategic effects in the affected location within 24 hours of receiving a request for assistance. There are instances, however, when particular disasters such as floods and forest fires can occur without sufficient forewarning to engage in the normal whole-of-government planning cycle. In such cases, our regional Joint Task Force commanders can initiate an immediate military response if they determine this is needed to save lives, alleviate suffering, and protect critical infrastructure. Known as a regional rapid response operation, this critical fail-safe in our response capability does not have to wait for a formal request for assistance. Among the many capable and unique resources and assets we can bring to bear from across our force generators are engineering, health services, force protection, transport, aviation, and logistics, among others. Once in location, our personnel work collaboratively with civilian authorities to assist in organizing the joint response to the crisis at hand, including effective command and control of the response.¹²³

An example of Operation LENTUS in action was seen during the 2014 Manitoba floods. CJOC deployed around 500 CAF members on that mission as well as four CH-146 Griffon helicopters and a CP-140 Aurora patrol aircraft for information, surveillance and reconnaissance of the situation.¹²⁴

119 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare).

120 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

121 Ibid.

122 Ibid.

123 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

124 Ibid.

Major-General Coates told the Committee that the CAF's Disaster Assistance Response Team (DART) – a multidisciplinary military unit capable of deploying on short notice anywhere in the world to provide emergency relief in the event of natural disasters and complex humanitarian crises – has repeatedly been deployed overseas, but it has not yet been used domestically. However, he pointed out that “it's within their plan, a plan we call Op RENAISSANCE,” to deploy in Canada.¹²⁵ He highlighted some of the reasons why DART has not so far been deployed domestically:

We find that we can often respond just as quickly if not more quickly with other resources that may be nearby. The elements of the DART are on an about one-day notice to move, or about two-day notice to be up and running. We maintain elements of our immediate reaction units that are dispersed across the country at a higher level of readiness than that. The DART affords great capabilities. Up until now we have just never needed to deploy it domestically.¹²⁶

However, this could change in the future. As an example, he pointed out that a major “earthquake in Vancouver scenario ... might see the DART deployed” in British Columbia.¹²⁷ In other words, the capability exists and can be used as required.

Some witnesses spoke about how newly acquired military equipment has enhanced the CAF's ability to respond to future disasters. Mention has already been made of how the new CC-177 Globemaster III and CC-130J Super Hercules transport aircraft have improved RCAF airlift capabilities in domestic operations, including disaster relief missions. The Committee was also told that the 15 recently acquired CH-147 Chinook helicopters will play a key role in future disaster response operations once they are fully operational. Major-General Coates pointed to their “incredible range of more than 1,000 kilometres,” their heavy lift capabilities and their speed, emphasizing that they “can reach up north very, very quickly.” This new helicopter, he noted, “will allow commanders to function by compressing time and distance in ways that we've not been able to before.”¹²⁸

A few witnesses also addressed the increasingly active role CAF reservists play in domestic operations. In recent years, reservists have repeatedly been mobilized in response to various emergencies. According to Rear-Admiral Jennifer Bennett, Chief of Reserves and Cadets, using reservists in such fashion has been a logical course of action “owing to the immense geography of our nation and current Canadian Armed Forces footprint.” Although the “Regular Force can more readily respond to crisis due to its breadth of training and full-time nature and is usually called upon as first responder for the Canadian Armed Forces,” Reserve Force units are often “in a better position to respond due to their proximity and familiarity with the affected community.”¹²⁹

125 Ibid.

126 Ibid.

127 Ibid.

128 Ibid.

129 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Rear-Admiral Jennifer Bennett).

Army Reserve units have been regrouped into 10 reserve Canadian Brigade Groups (CBG), which are located in different regions of the country. These CBGs, in turn, form part of five Canadian Divisions, each of which commands the Regular Force and Reserve Force personnel serving within its specific geographical area of responsibility. The Canadian Divisions, including the CBGs, regularly train and coordinate with federal and provincial emergency management organizations in preparation for domestic operations. Moreover, there is within each CBG one Territorial Battalion Group specifically devoted to domestic responses. Brigadier-General P.J. Bury, Director General, Reserves and Cadets, stated:

Part of the Territorial Battalion Groups is the Domestic Response Companies, and these are companies' worth of soldiers, sailors, and aviators who will come together on many times quite short notice to respond to fires, floods, what have you. [Also] nested within the battalion group structure is the Arctic [Response] Company Groups. There's a number of these throughout the country and they train for specifically deploying and operating in very austere northern and Arctic environments.¹³⁰

Rear-Admiral Bennett told the Committee that the CAF continue to review and refine the training requirements and readiness levels of the Reserve Force in order to maximize their contribution and efficiency on operations. She said that the CAF are also "interested in expanding the use of reservist civilian skills" to improve civil-military cooperation (CIMIC) on domestic operations.

One of the things that we have to improve first is our inventory of civilian skills and our database that is fairly restrictive right now in that it only records the two official languages we have. In our new personnel management system that's being developed across the Canadian Armed Forces we will have an inventory that will allow for greater space to provide civilian qualifications, civilian employer, languages beyond English and French ... We've also on domestic deployment in particular utilised local knowledge and connections in the case of local disaster emergency response, someone who is connected through the city council or through the chamber of commerce or has professional skills. Unfortunately it's often been a happy coincidence or discovery. So once we establish that inventory of civilian skills that will go a long way ... We do think that there is a great opportunity for cost saving as well with people who can be better trained or more extensively trained and bring their civilian experience. That's why we're looking at things like cyber where that is an area of expertise that someone could bring into the force as opposed to simply sharing a qualification or a background.¹³¹

Looking at the future role of the Reserve Forces, Rear-Admiral Bennett said that the CAF are indeed considering "expanding reserve areas of expertise in the future" to include certain key capabilities that could be used on operations, such as cyber capabilities.¹³²

130 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Brigadier-General P.J. Bury).

131 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Rear-Admiral Jennifer Bennett).

132 Ibid.

6. Search and Rescue

In Canada, search and rescue is a whole-of-government affair. Responsibilities are shared among federal, provincial, and territorial governments. Ground search and rescue, for example, is conducted under the legal authority of the provincial and territorial governments. The RCMP is the “operational authority” for ground search and rescue in all provinces except Ontario, Quebec and parts of Newfoundland and Labrador. In Ontario there is the Ontario Provincial Police, in Quebec the Sûreté du Québec, and in the remaining parts of Newfoundland and Labrador the Royal Newfoundland Constabulary. For ground search and rescue incidents occurring in national parks, Parks Canada is the “operational authority.” The Canadian Coast Guard, in turn, has the primary responsibility for maritime search and rescue services and the CAF for aeronautical search and rescue services. According to DND, the CAF are responsible for “the effective operation of this coordinated aeronautical and maritime SAR [search and rescue] system.” The “control and conduct of aeronautical SAR and coordination of maritime SAR operations” rests with CJOC.¹³³

Aeronautical and maritime search and rescue operations are divided into three search and rescue regions, each managed by a Joint Rescue Coordination Centre, or JRCC, which is jointly staffed by specialized search and rescue personnel from the CAF and the Canadian Coast Guard. The JRCCs provide aeronautical and maritime search and rescue services in their respective areas of responsibility. They can task dedicated CAF aircraft and Canadian Coast Guard ships to respond to search and rescue incidents occurring within their regions. JRCC Victoria in British Columbia takes care of Western Canada, JRCC Halifax in Nova Scotia of Eastern Canada,¹³⁴ and JRCC Trenton in Ontario is responsible for Central and Northern Canada.¹³⁵ Major-General Wheeler said that the JRCCs are “on the front line of saving Canadians.”¹³⁵

Every year, the CAF respond to an average of about 10,000 search and rescue incidents, around 1,000 of them requiring the deployment of search and rescue aircraft. Search and rescue technicians often have to work in extremely harsh environments and difficult conditions. It should be noted that the three search and rescue regions cover a land and sea area of approximately 18 million square kilometres.¹³⁶ Rear-Admiral Newton, Commander of JRCC Halifax, provided the following insight on the challenges of conducting search and rescue in his area of operation:

Given the broad maritime domain, frequent extreme weather, winter icing, busy international shipping lanes, active domestic and international fisheries, tourism, and Canada's only offshore petroleum production fields, search and rescue in the region is busy and demanding. Despite this it is very successfully managed due to the expertise and professionalism of the rescue boat crews, the flight crews, and the search and rescue technicians. Constant liaison with the various SAR stakeholders, tactical and

133 DND, “[Search and Rescue Canada](#).”

134 Ibid.

135 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

136 DND, “[Search and Rescue Canada](#).”

operational level exercises, and collaboration with provincial and territorial governments ensures that the system functions optimally.¹³⁷

In addition to these challenges, the Committee heard of ongoing problems with the CH-149 Cormorant search and rescue helicopters, of growing reliance on smaller and shorter-ranged CH-146 Griffon helicopters, and of the need to replace the RCAF's aging fleets of CC-115 Buffalo and CC-130H Hercules fixed wing search and rescue aircraft.¹³⁸

That said, several witnesses suggested that in spite of those equipment challenges, the CAF remain capable of satisfactorily conducting search and rescue with existing air assets. Major-General Wheeler said:

I'm not saying that at the end of the day we're not going to need to replace resources. Obviously, it's just equipment, so we will need to do that, but the equipment that we have currently is certainly capable of doing the job.¹³⁹

Likewise, Colonel Lowthian agreed with this assessment and further indicated that 8 Wing ground crews are keeping the older CC-130H Hercules aircraft "fleet fairly healthy to meet the response postures" and that he has not yet "seen any service ability issues that would prevent" those aircraft from doing their search and rescue missions. He also said that the acquisition of the CC-130J Super Hercules aircraft in recent years "specifically for the tactical airlift role has allowed [8 Wing] to put [its] energies into the H model fleet only for its search and rescue role." In other words, these airframes are no longer dual-purposed.¹⁴⁰

The Committee also heard about search and rescue response times and how these have been adjusted in recent years to achieve better results.¹⁴¹ "Over the last two years, we've modified the 30 minute response posture that we maintain" across Canada, said Colonel Lowthian.

Historically, it has been a 30 minute response posture Monday to Friday, daytime hours, 8 a.m. to 4 p.m. ... In summer 2013, we introduced a modified posture during the summer months ... and the reason behind this was to slew or adjust the response posture timing so that they would better meet historically higher risk periods to respond in 30 minutes or less. In summer 2013, we met with some very marked success ... by modifying that posture closer to a Thursday to a Monday 30 minutes response posture, between midday and later evening hours, and having our two hour response posture moved to the periods where there was less risk. Statistically, we met with better success. We have since modified or improved upon it last summer, where we adjusted and expanded the hours where the 30 minute liability was offered. Again, we met with better success.¹⁴²

137 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 February 2015 (Rear-Admiral John Newton).

138 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Colonel David W. Lowthian).

139 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

140 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Colonel David W. Lowthian).

141 DND, "[CAF Trialing Adjusted SAR Response Times](#)," 6 February 2015.

142 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Colonel David W. Lowthian).

Colonel Lowthian, however, said that “to move to 30 minutes around the clock would probably be very resource intensive.” In his view, there would “have to be considerable study and some manpower assessment” before such a response posture could be adopted.¹⁴³

7. Arctic Security

The Arctic is a vast and remote territory that presents many difficulties in terms of surveillance, regulation and infrastructure development. Joint Task Force (North) is responsible for CAF operations in the North.¹⁴⁴ Its area of responsibility is approximately four million square kilometres, which represents about 40% of Canada’s land mass and 75% of its coastline.¹⁴⁵

In the North, CAF personnel and assets are essentially used to monitor and control the northern airspace in cooperation with the U.S. through NORAD; to conduct air, land and sea surveillance and security patrols; to undertake routine sovereignty operations; to respond to aeronautical and maritime search and rescue incidents; and to operate and maintain various military facilities in the region, such as radar and signal intelligence stations. They also provide assistance and regularly work in partnership with various federal, provincial and territorial government departments and agencies in the region. This includes such federal partners as the Canadian Coast Guard, Environment Canada, Fisheries and Oceans Canada, the RCMP, Public Safety Canada, and Transport Canada.¹⁴⁶

The CAF, for example, cooperates with regional partners through the Arctic Security Working Group, which meets twice a year. Brigadier-General G.D. Loos, Commander of Joint Task Force (North), said this forum brings together federal, territorial, regional, and municipal emergency measures organizations with an interest in Arctic safety and security, which includes the RCMP and the Canadian Coast Guard.¹⁴⁷ He said, the Arctic Security Working Group not only provides a forum to share knowledge, but also to foster stronger relationships with one another. “We understand each other’s mandates better, what resources are available to throw at any potential future response or crisis,” Brigadier-General Loos said. Above all, “it’s about having pre-crisis relationships among all the main players before something comes along.”¹⁴⁸

The CAF permanent military presence in the Arctic consists of a number of assets. This includes, among others, five Canadian Ranger Patrol Groups comprised of approximately 5,000 Canadian Rangers organized in 179 patrols, which conduct

143 Ibid.

144 DND, “[Canadian Joint Operations Command](#),” “[Operations in Canada and North America](#),” “[Regional Joint Task Forces](#)” and “[JTF North: About Us](#).”

145 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos).

146 DND, “[Operations in the North](#)” and “[Search and Rescue](#).”

147 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos).

148 Ibid.

surveillance and sovereignty operations and essentially serve as the “military’s eyes and ears” in the North.¹⁴⁹ Brigadier General Kelly Woiden, Chief of Staff, Army Reserve, stated that the “Canadian Rangers are dedicated, knowledgeable [CAF] members who provide self-sufficient, lightly equipped, mobile forces in support of Canada’s military sovereignty and domestic operations.” The Canadian Rangers are a component of the CAF Reserve Force.¹⁵⁰

Apart from the Canadian Rangers, there is also Joint Task Force (North) headquarters in Yellowknife, Northwest Territories, and its detachments in Whitehorse (Detachment Yukon) and Iqaluit (Detachment Nunavut). The Loyal Edmonton Regiment’s C Company is currently in Yellowknife, the first and only army reserve unit to be stationed in the Arctic. Also located in Yellowknife is 440 Transport Squadron and its four CC-138 Twin Otter aircraft, which is the sole air force flying unit permanently based in the Arctic. The CAF maintains Forward Operating Locations for fighter aircraft operations in Inuvik, Yellowknife, Iqaluit and Rankin Inlet, which are used several times each year by NORAD for basing, refuelling and maintenance. The CAF operates the North Warning System, a network of 11 long-range and 36 short-range radar stations located on the shores of the Arctic Ocean, as well as the signals intelligence station CFS Alert. Working in conjunction with two similar stations located in Massett, British Columbia, and Gander, Newfoundland and Labrador, CFS Alert is an important contributor to the defence of North America. It intercepts foreign signals beyond our national borders and provides that vital intelligence to the CAF and NORAD. There is also the CAF Arctic Training Centre in Resolute Bay, a recently built multipurpose facility used to train military personnel, store equipment and supplies, and support northern operations.¹⁵¹ These CAF permanent facilities in the Arctic essentially serve as “northern operational hubs” that can be used as “launching pads” for operations anywhere in the Canadian North.¹⁵²

In addition, the CAF regularly deploy army, navy and air force personnel and assets from southern Canada to the Arctic. RCAF aircraft, for example, provide vital resupply services for northern military installations, support search and rescue missions in the North, and conduct regular sovereignty, reconnaissance and surveillance patrols in the Arctic. Although the RCN does not operate icebreakers, it has frequently deployed warships and submarines to northern waters in recent years, particularly during the summer months. The Canadian Army maintains four Arctic Response Company Groups, specially raised units composed mostly of reservists that stand ready to be deployed on

149 DND, “[Operations in the North](#),” “[About the Canadian Rangers](#),” and “[Canadian Rangers – Organizational Structure: Patrol Groups](#).”

150 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 18 February 2015 (Brigadier-General Kelly Woiden).

151 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 18 February 2015 (Colonel S.M. Moritsugu); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler). See also DND, “[Operations in the North](#).”

152 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 18 February 2015 (Brigadier-General Kelly Woiden).

short notice from southern Canada to the Arctic. Other Canadian Army units from across Canada also regularly partake in military exercises in the North.¹⁵³

“Situational awareness [in the Arctic] is accomplished via a number of means,” Brigadier-General Loos told the Committee. These means range from using the Canadian Rangers and “using a number of military systems,” such as radars and satellites, to “carrying out specific air and maritime surveillance and presence missions” and “sharing information with partners from other military units, allied military formations, and other government departments.”¹⁵⁴ He told the Committee that what the CAF are really “seeking to surveil is activity in the North that could result in a requirement to respond to a safety or security need.” And this is done in cooperation with Public Safety Canada, the Canadian Coast Guard, the RCMP and local law enforcement organizations, First Nations partners and other stakeholders in the region.¹⁵⁵

To improve its level of readiness and foster partnerships with regional federal, territorial and Aboriginal stakeholders in the region, among other goals, the CAF conduct a series of sovereignty operations each year in the high, western, and eastern Arctic, such as Operations NUNALIVUT, NUNAKPUT, NANOOK and QIMMIQ, which involve army, navy and air force personnel and assets. The CAF also conduct joint search and rescue exercises with the other Arctic countries in the region under the terms of the *Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic* of 2011.¹⁵⁶

Moreover, over the past decade, several federal government policy announcements have been made on the enhancement of CAF strategic capabilities to operate in the Arctic, especially with respect to surveillance, patrol and communications. Recent examples of such policy statements have appeared in the *Canada First Defence Strategy* and *Canada’s Northern Strategy*, as well as various Speeches from the Throne and federal budgets.¹⁵⁷ In recent years, the Canadian government has announced a number of initiatives to strengthen the CAF presence in the Arctic. Aside from the six Arctic/Offshore Patrol Ships mentioned earlier in this report, below are some of the ongoing projects:

153 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Brigadier-General G.D. Loos). See also DND, “[Operations in the North](#),” “[Operation NEVUS](#)” and “[JTF North: Exercises and Activities](#)”; DND, “[News Release – True North, Strong, Proud and Ready: Canadian Army Training in Arctic Exercises](#),” 19 February 2014; DND, “[Operation Boxtop Supplies Remote Canadian Station](#),” 23 October 2014; Regehr, [Circumpolar Military Facilities of the Arctic Five](#), pp. 3–20.

154 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos).

155 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Brigadier-General G.D. Loos).

156 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Brigadier-General G.D. Loos). See also DND, “[Operations in the North](#),” “[Operation NUNALIVUT](#),” “[Operation NUNAKPUT](#),” “[Operation NANOOK](#),” “[Operation QIMMIQ](#)” and “[Search and Rescue](#).”

157 Ryan Dean, P. Whitney Lackenbauer and Adam Lajeunesse, [Canadian Arctic Defence Policy: A Synthesis of Key Documents, 1970–2013](#), Centre for Military and Strategic Studies (University of Calgary) and Centre on Foreign Policy and Federalism (St. Jerome’s University), 2014, pp. 39–79; DND, [Canada First Defence Strategy](#), 2008; Government of Canada, [Canada’s Northern Strategy](#), 2009.

- *Nanisivik Naval Facility:* A deep water docking and refuelling facility is being built in Nanisivik, Nunavut, to improve CAF's ability to maintain a presence in Canada's Arctic waters throughout the navigable season. The facility will serve as a staging area for naval vessels on station in the Arctic, enabling them to resupply, refuel, embark equipment and supplies, and transfer personnel. The facility is expected to be operational by 2018.¹⁵⁸
- *Enhanced Surveillance Capabilities:* A number of projects are underway or under investigation to enhance the CAF's ability to conduct surveillance in the North and improve Canada's Arctic situational awareness. This includes, among other things, the modernization of the CP-140 Aurora patrol aircraft and its eventual replacement (Multi-Mission Aircraft project); the use of space-based satellite technology (Polar Epsilon 1 and 2 projects); the replacement of the North Warning System radar stations; and the improvement of polar communication and weather monitoring systems. DND also continues to explore various surface and underwater sensor technologies to enhance Arctic security and surveillance (Northern Watch Technology Demonstration project).¹⁵⁹
- *Unmanned Systems:* Under the Joint Unmanned Surveillance and Target Acquisition System (JUSTAS) project, the CAF is investigating the possibility of acquiring a fleet of Unmanned Aerial Vehicles (UAVs) to enhance Arctic and maritime domain awareness. Moreover, in 2014, DND conducted a series of experiments in the Arctic to test new unmanned aerial vehicle and unmanned ground vehicle technology.¹⁶⁰
- *New Aircraft:* In the coming years, the procurement of new military aircraft is expected to further enhance CAF capabilities in the North. This includes, among other things, the acquisition of a replacement fighter aircraft, fixed-wing search and rescue aircraft, multi-mission patrol aircraft, and new general utility transport aircraft. Projects are also underway to modernize and extend the life of the existing fleet of Twin Otter general utility transport aircraft and Aurora patrol aircraft.¹⁶¹

158 ["Arctic Naval Facility at Nanisivik Completion Delayed to 2018,"](#) *CBC News*, 4 March 2015; David Pugliese, ["Nanisivik Naval Facility was Originally Supposed to Cost \\$258 Million but DND Balked at Price Tag,"](#) *Ottawa Citizen*, 8 September 2014; Regehr, *Circumpolar Military Facilities of the Arctic Five*, p. 4.

159 DND, ["Aerospace Systems,"](#) ["Naval Systems,"](#) and ["Joint and Other Systems,"](#) *Defence Acquisition Guide 2015*; Regehr, *Circumpolar Military Facilities of the Arctic Five*, pp. 15–17; Defence Research and Development Canada (DRDC), ["Northern Watch Technology Demonstration Project"](#); Government of Canada, *Achievements Under Canada's Northern Strategy, 2007–2011*, p. 11.

160 DND, ["Aerospace Systems,"](#) *Defence Acquisition Guide 2015*; DND, ["Joint Arctic Experiment 2014 Demonstrates Capabilities of Unmanned Systems at CFS Alert,"](#) 22 October 2014.

161 DND, ["Aerospace Systems,"](#) *Defence Acquisition Guide 2015*.

- *New Arctic Equipment:* Several projects are underway to enhance the CAF's' capability to operate in the Arctic environment. This includes, among other things, the acquisition of new snowmobiles and all-terrain vehicles as well as new winter mobility equipment for Canadian soldiers, including snowshoes, skis, and toboggans. It also includes the procurement of a new rifle for the Canadian Rangers.¹⁶²

B. Strengthening the Canadian Armed Forces and Canada's Defences

In discussing the CAF and Canada's defences over the course of the study, witnesses put forth a number of suggestions for areas of improvement. The Committee was told that progress could be made in the realms of defence policy, domain surveillance and enforcement capabilities, cyber security and defence procurement.

1. Reviewing Defence Policy

According to several witnesses, Canada needs to review its defence policies. The *Canada First Defence Strategy* (CFDS) of 2008, they argue, is unaffordable and needs to be reviewed. "The budget outlined in the CFDS was too small to acquire all the capital acquisitions outlined in the document," David Perry, Senior Security and Defence Analyst with the CDAI told the Committee. "And since its release, much of this funding has been reduced and delayed. A lack of articulated strategic priorities has made resolving this gap between funding and capabilities a problem."¹⁶³

During her testimony, Jill Sinclair, DND's Assistant Deputy Minister, Policy, said that DND is working on a "reset of the CFDS" and that "[some] of the things the *Canada First Defence Strategy* refresh will look at, in particular, is cyber ... and space, and also intelligence capability."¹⁶⁴ DND's *Report on Plans and Priorities 2014-2015* further noted that "in reviewing the 2008 CFDS, the government's focus for the Canadian Armed Forces, now and for the future, is to defend Canada and protect its borders; maintain sovereignty over its northern lands and waters; fight alongside allies to defend our interests; and to respond to emergencies within Canada and around the world."¹⁶⁵

Although work on the renewed CFDS has been underway since at least 2013, it is still not known when it will be completed or when it will be publicly released.¹⁶⁶ David Perry said that the "review of the *Canada First Defence Strategy* must be completed" as soon as possible. And "as part of that review," he added, "DND should establish geostrategic

162 DND, "[Land Systems](#)," *Defence Acquisition Guide 2015*; Murray Brewster, "[Army Scrambles to Buy Snowmobiles for Arctic Units Amid Spending Deep Freeze](#)," *The Globe and Mail*, 18 August 2013; Regehr, *Circumpolar Military Facilities of the Arctic Five*, pp. 17–18.

163 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 January 2015 (David Perry).

164 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 27 March 2014 (Jill Sinclair).

165 DND, [Report on Plans and Priorities 2014-2015](#), p. 5.

166 David Perry, "CFDS (R): Renewing the Canada First Defence Strategy," *Canadian Naval Review*, Vol. 10, No. 2 (2014), pp. 36-37.

priorities to direct future procurements, resolve the mismatch between funding and capabilities in its defence plan, and prioritize planned defence acquisitions.”¹⁶⁷

However, some witnesses believe the Canadian government should do more than simply reset the CFDS. In their *Strategic Outlook for Canada 2014*, Ferry de Kerckhove and George Petrolekas of the CDAI recommended that the Canadian government “undertake a full foreign policy, trade and development as well as defence review ... in order to present a unified vision of Canada’s role in the world and of its means to exercise it” and that “one of the products of such a review would be a new Defence White Paper or National Security Strategy” that would “go beyond a simple reset of CFDS.”¹⁶⁸

Mr. de Kerckhove and Mr. Petrolekas reiterated this perspective when they appeared before the Committee. “A real whole-of-government approach is required to ensure a seamless analysis of the risks faced by Canada, the extent to which our interests are affected, the response or range of possible responses required, and the options and capabilities available to allow our political masters to take the best possible decisions in the circumstances,” Mr. de Kerckhove told the Committee.¹⁶⁹ A Defence White Paper or National Strategic Study, he said, would provide a “very clear articulation” of the federal government’s short-term and long-term strategic vision for the future and what capabilities the armed forces should prioritize to conduct operations domestically, continentally and internationally. “We contend that absent an articulated vision of its role in the world and the provision of the right means to achieve it, Canada risks doing little and mattering less in the world affairs,” Mr. de Kerckhove argued.¹⁷⁰

Canada should consider increasing its defence budget, according to Colin Robertson. “To underpin our diplomacy and foreign policy,” he said, “we need military capability and we leverage this through our alliances,” especially NATO. “For 65 years, the NATO alliance has served Canada’s collective defence commitment. NATO is the effective cop on the global beat, the go-to organization when muscle is required to manage chaos and restore order.” However, Mr. Robertson pointed out that “less than a handful of the 28 NATO countries currently meet their commitment to spend 2% of GDP on defence” and added that “we in Canada currently spend 1% of our GDP on defence.” In his opinion, “Canada can demonstrate leadership within NATO by significantly strengthening [its] military capabilities.”¹⁷¹

2. Strengthening and Improving Recruitment

The Committee was told that the CAF have been experiencing problems with recruitment and meeting its target strength levels. The CAF’s target strength is currently

167 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 January 2015 (David Perry).

168 Conference of Defence Associations Institute (CDAI), [The Strategic Outlook for Canada 2014](#), February 2014, p. 61.

169 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (Ferry de Kerckhove).

170 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (Ferry de Kerckhove and George Petrolekas).

171 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson).

fixed at 68,000 Regular Force members, 27,000 Primary Reserve Force members and 5,000 Canadian Rangers.¹⁷² However, DND's *Report on Plans and Priorities 2015-2016* indicated that the CAF "is currently below its desired end-state for total Regular Force manning of 68,000 ... due to higher than forecasted attrition and other factors." It also stated that the CAF "is currently below the Government of Canada directed target of 27,000 average paid strength for Primary Reserve, due to higher than forecasted attrition and challenges in meeting recruiting quotas."¹⁷³ This was confirmed by witnesses. In March 2015, Rear-Admiral Jennifer Bennett, Chief of Reserves and Cadets, told the Committee that the average paid strength of the Primary Reserve Force was 21,700.¹⁷⁴ In May 2015, Minister of National Defence Jason Kenney told the Committee that the strength of the Regular Force was at 65,900.¹⁷⁵ Maintaining CAF recruitment and target strength levels is important, Minister Kenney said. "We do need to catch up a little bit on recruitment here to maintain a steady state."¹⁷⁶

3. Enhancing Domain Surveillance and Enforcement Capabilities

Several witnesses told the Committee that Canada needs to enhance its domain awareness capabilities, particularly in the Arctic and the maritime domains, as well as its capacity to respond to various emergencies and threats in those environments.

Professor Elinor Sloan, for example, stated that "Canada does not have the necessary assets to exert surveillance and control over the Arctic maritime region." She said that Canada is dependent for Arctic surveillance on the North Warning System, occasional flights by Aurora long-range patrol aircraft, satellite coverage from RADARSAT and its Polar Epsilon component for defence, and some "fixed surveillance assets along the most travelled straits" in the region.¹⁷⁷ In her view, Canada needs to have more surveillance capabilities. She urged Canada to "move forward" with its RADARSAT

172 The CAF's Reserve Force is subdivided into four components: the Primary Reserve (consisting of the Army Reserve, the Naval Reserve, the Air Reserve, the Health Services Reserve, and the Legal Reserve), the Canadian Rangers, the Supplementary Reserve, and the Cadet Organizations Administration and Training Service (COATS). Only the Primary Reserve and the Canadian Rangers regularly train for and participate in military operations. The Supplementary Reserve is essentially a "pool" of retired CAF members that could be called out on active service in the event of a national emergency. They are not required to perform military duties or train. There were about 15,600 Supplementary Reservists in March 2015. COATS members supervise, administer and train youth serving in the Cadets and Junior Canadian Rangers. COATS members do not train for or participate in military operations. There were about 8,000 COATS members in March 2015. NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Rear-Admiral Jennifer Bennett); DND, [Report on Plans and Priorities 2015-2016](#), p. 19; [Section 4: Canada's Reserve Force](#), *Report on Plans and Priorities 2015-16*, "About the Canadian Armed Forces."

173 DND, [Report on Plans and Priorities 2015-2016](#), p. 19.

174 In March 2015, Rear-Admiral Jennifer Bennett, Chief of Reserves and Cadets, indicated that 27,100 people were enrolled in the Primary Reserve Force. However, the average paid strength, she said, was 21,700. She said the difference in number as follow: "Because people parade or train on a part-time basis that may surge at certain periods during the year, we average that out over a period of about nine months, so the average paid strength of people who are attending on a regular basis is just over 21,000." NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 March 2015 (Rear-Admiral Jennifer Bennett).

175 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2015 (Jason Kenney).

176 Ibid.

177 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

Constellation satellite project, arguing that it was “absolutely critical to have those three or five satellites, low-based, looking down at the Arctic at all times.”¹⁷⁸

According to Professor Sloan, the key capability gap in the Canadian arsenal of surveillance tools is Unmanned Aerial Vehicles (UAVs). “The important asset we were missing is unmanned aerial vehicles that can conduct surveillance in Arctic conditions,” she told the Committee. In her view, UAVs are “critical ... They’re the answer to providing real-time continuous surveillance over a large barren area.”¹⁷⁹

Several other witnesses supported the notion that Canada should acquire UAVs.¹⁸⁰ Professor Christopher Sands, of John Hopkins University, said there are advantages to operating UAVs in the Arctic and maritime domains:

I think drones are very useful ... They are cheaper, lighter, easier to upgrade, and they give you great range. Canada has a tremendous coastline and an enormous amount of territory to cover, so for the dollar a fleet of drones could do more than the cost of a single fighter aircraft. In that sense, it could be a very promising technology.¹⁸¹

The advantage of UAVs over other surveillance assets was emphasized on several occasions. Some witnesses, for example, pointed to the limitations of satellites and their geostationary orbits.¹⁸² Charles Barlow, President of Zariba Security Corporation, stated:

Satellites can't see through clouds very well. So, again, you get back to some sort of aircraft, be it manned or unmanned, that can fly lower under the clouds and see what the situation is. Satellites have fundamentally changed the way the world works ... But they don't replace that closer-in stuff, and they never really will be able to. It's also very, very difficult to task a satellite. Satellites do their thing, and if you need a satellite over an area and the satellite's not doing that right now, then you're out of luck. That's just the way it goes.¹⁸³

Mr. Barlow told the Committee that UAVs produce much higher resolution data than satellites, are much less expensive to acquire, and can operate in an area for longer periods of time.¹⁸⁴ Major-General Coates said that CJOC would definitely be interested in UAV technology for Arctic and maritime domain awareness.¹⁸⁵

There was debate among witnesses as to what type of UAVs would be best for Canada. Some witnesses like Professor Sloan, for example, maintained that Canada requires a fleet of High Altitude, Long Endurance (HALE) and/or Medium Altitude,

178 Ibid.

179 Ibid.

180 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 27 November 2014 (Major-General Fraser Holman).

181 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 4 December 2014 (Christopher Sands).

182 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 27 November 2014 (Major-General Fraser Holman); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (James Fergusson).

183 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 2 December 2014 (Charles Barlow).

184 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 2 December 2014 (Ian Glenn).

185 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

Long-Endurance (MALE) UAVs, such as the Global Hawk or Predator both of U.S. origin. These machines “can provide continuous near real-time coverage of what's happening on the water” or in the Arctic. In her view, the CAF’s JUSTAS project, tasked for several years with investigating the possibility of acquiring a HALE or MALE UAV capability, needs to move forward.¹⁸⁶

Other witnesses believed that cheaper and smaller UAVs would offer a better solution. For example, Ian Glenn, Chairman and Chief Executive Officer of ING Robotic Aviation, argued that smaller UAVs could be flown in greater number from various locations across the country, thereby providing enhanced domain awareness. Having the Canadian Rangers fly small UAVs, he suggested, would be a low cost way of increasing Arctic domain awareness. Small UAVs could not only be utilized for surveillance, but also for search and rescue. UAVs, he pointed out, can be used to drop emergency supplies. Mr. Glenn said:

One of the things you can do with a robotic aircraft is fly out and see things without putting anyone in harm's way. That means that you, as the person responsible, can take greater risks without risking others' lives to go and see things ... You can provide from a community a fast search response with locally based robotic aircraft. They're persistent and you can exploit local knowledge. You can even do things like drop emergency supplies. That's a pretty cool capability. This is enabled by the fact that we have smart robots that can be flown locally in the community and, in the north, by Rangers.¹⁸⁷

Despite the range of technical options available, most witnesses stressed that domain awareness requires a system of systems. All have their strengths and limitations and domain awareness cannot rely uniquely on one particular system. The best use of UAVs would therefore be to operate them in concert with other surveillance assets, including satellites, radars, surface and underwater sensors, aircraft, ships, and other technologies.¹⁸⁸

Some witnesses urged the federal government to move forward with the acquisition of new aircraft fleets to enhance domain awareness and enforcement capabilities. Other witnesses also urged Canada to move forward with the acquisition of a replacement fighter to replace the aging CF-18s, though there was debate as to whether it should be a fifth-generation fighter or a fourth-generation type.¹⁸⁹ According to Lieutenant-General Parent, Canada is “fully integrated with the U.S.” and does not operate “incompatible technology,” but this “might not be the case in the future.”¹⁹⁰

Some witnesses also spoke about the need to enhance federal icebreaking capabilities. Although several witnesses noted that the Arctic/Offshore Patrol Ships will

186 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

187 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 2 December 2014 (Ian Glenn).

188 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 4 December 2014 (Charles Doran).

189 For example, see NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (Ferry de Kerckhove); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 1 May 2014 (Alexander Moens and Stephen Saideman).

190 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

increase RCN capabilities in the Arctic,¹⁹¹ Professor Rob Huebert argued that Canada should invest more resources in recapitalizing the Canadian Coast Guard's icebreaking fleet.¹⁹² The Canadian Coast Guard's largest and most capable icebreaker, the CCGS *Louis S. St-Laurent*, is scheduled for decommissioning in a few years. The Canadian Coast Guard will be acquiring a new polar icebreaker, the CCGS *John G. Diefenbaker*, to be built in Canada and scheduled to join the fleet around 2022. But no other icebreakers are currently scheduled to be built. Nonetheless, each year, the Canadian Coast Guard deploys six of its aging light and medium icebreakers to the Arctic from June to November.¹⁹³ These vessels will soon need to be replaced. "What we absolutely need is to have a series of replacements for our mid-level icebreakers, the real workhorses," Professor Huebert told the Committee. "People don't like talking about getting these medium ships but that is absolutely necessary." In comparison, He noted that Russia, Finland and Norway are all presently building up their icebreaking capabilities. Even the Chinese have expressed an interest in expanding their icebreaking fleet.¹⁹⁴

A few witnesses such as Professor Elinor Sloan and George Petrolekas also suggested that Canada should establish an armed coast guard like the U.S., arguing that it would be an effective use of resources to do so.¹⁹⁵ At the moment, none of the Canadian Coast Guard ships are armed, except for two vessels on the East coast each fitted with a .50 calibre machine gun as well as 9 mm hand guns. "We are not mandated to do law enforcement and security," emphasized Nadia Bouffard.¹⁹⁶ Professor Rob Huebert, on the other hand, did not believe there was a need to arm the coast guard. He preferred a whole-of-government approach to operations in the maritime domain, particularly in the Arctic Ocean. When asked whether the Canadian Coast Guard needed to be backed up by naval power in the Arctic, Professor Huebert responded: "I don't believe that you draw distinction."¹⁹⁷

4. Improving Cyber Security

The CAF and DND are currently responsible for protecting their own computers and systems from cyber threats. Brigadier-General Loos told the Committee that while the CAF have cyber defence capabilities today, it "needs more" and currently has "plans to invest in more." He further elaborated that it is "recognized that we have to defend our systems and that is a requirement wherever you're based, here, in the north or overseas."¹⁹⁸ Lieutenant-General Parent expressed a similar view about the cyber security of NORAD systems. "We have to operate with cyber systems, and we have to operate in a contested

191 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos).

192 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 December 2014 (Robert Huebert).

193 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Nadia Bouffard and Gregory Lick).

194 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 December 2014 (Robert Huebert).

195 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (George Petrolekas); NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

196 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Nadia Bouffard and Gregory Lick).

197 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 December 2014 (Robert Huebert).

198 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos).

cyber environment,” he told us. “In those terms, we have to stay ahead of the threats in trying to outpace the threats so that our systems are not vulnerable to cyber attacks.” This means having “good cyber hygiene, anti-virus, and proper firewalls” as well as “isolating critical systems from the Internet.”¹⁹⁹

Witnesses identified a number of ways Canada could enhance cyber security and better protect its systems and critical infrastructures. Rafal Rohozinski, for example, urged Canada to invest in its cyber capabilities from a national security and defence standpoint. “We do have to wake up and recognize that an investment in cyber as a capability of national security and national defence is a critical requirement and something that we do have to spend the time and resources to develop,” he told the Committee.²⁰⁰

Professor Elinor Sloan concurred, adding that there has not been “enough thought as to the role of defence in the cyber realm” in Canada. If there “were a cyberattack that resulted in the loss of life,” she asked, “what would be the role of defence?”²⁰¹ Her answer:

Defence could have a role through assistance to civil authority in consequence management should a cyber attack result in a loss of critical infrastructure and pose a threat to life, or indeed have a loss of life as a result of that threat to the critical infrastructure. Defence would need to remain capable of operating under such a scenario and its own cyber infrastructure must be resilient.²⁰²

Professor Sloan also believes Canada needs to examine what role defence might play in a “future security environment if cyber – in other words, cyber army, navy, air force, cyber space – becomes a separate domain of conflict, and what capabilities our Canadian Forces would need. Building capacity in this area would take time.”²⁰³ In her view, the sooner Canada starts preparing for cyber warfare, the better.

Mr. Rohozinski stated that having the military involved in cyber security makes sense. He said cyber space has become a domain of warfare. He told the Committee:

The critical dependence that advanced industrial societies have on cyber infrastructure, including ... our national defence institutions means that cyber space has become an active zone of experimentation and development of capabilities, both offensive and defensive. Whether we wish cyber space to become the domain of military activity or not, the reality is that it will as it offers threat actors—be they states, transnational criminal organizations, terrorist organizations, or superpowered individuals—the ability to create and generate sustained effects. Put simply it offers them an opportunity to leapfrog generations of industrial warfare and to compete on a global scale in the ability to muster the use of force to further political effects ... What is also perhaps notable about the use

199 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

200 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Rafal Rohozinski).

201 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

202 Ibid.

203 Ibid.

of cyber space and its military dimension is that the threshold for generating effects does not require the resources available to a state.²⁰⁴

Mr. Rohozinski said cyber security has not yet been “elevated to a national security priority” in Canada. In his view, there needs to be better control and coordination of cyber security across the whole of government for that to happen. He believes Canada should establish two centralized federal government organizations that would deal specifically with cyber security issues, one civilian and one military.²⁰⁵ Creating both a military and civilian organization to deal with cyber security is a growing trend internationally, he stated:

About 90 countries are starting to develop the equivalent of what would be a cyber command, which means a military organization that effectively looks at cyber space as a domain for operations and that trains, equips, and develops a doctrine for being able to conduct operations therein. Clearly that's happening in other Five Eyes countries.

According to Mr. Rohozinski, in allied countries such as the U.K. and the U.S.:

You've also seen coordination amongst the civilian agencies, such as Homeland Security [in the U.S.] ... and the critical infrastructure protection office in the U.K., which have taken capabilities from GCHQ [Government Communications Headquarters, U.K.] and NSA [National Security Agency, U.S.] and moved them into civilian agencies that have responsibility for critical infrastructure, the financial sector, the energy sector, etc.²⁰⁶

Mr. Rohozinski believes Canada should do the same and create a military cyber command like the U.S. as well as a “civilianized, non-military, non-intelligence institution that would coordinate cyber security across the board.” In his opinion, some cyber security capabilities that are currently with Communications Security Establishment Canada (CSEC), which is part of the national defence portfolio, would need to be migrated to that new civilian organization with a clearer mandate for cyber security.²⁰⁷

Some witnesses also believed that the Canadian military should possess offensive cyber capabilities. Professor Alexander Moens told the Committee that Canada should invest in both “robust cyber offence and cyber defence” capabilities.²⁰⁸ In reference to offensive cyber capability, Professor Elinor Sloan said “we're talking about cyber war as a non-kinetic tool of warfare – taking out enemy platforms or whatever using cyber capabilities.”²⁰⁹

Canada ... needs to think about the degree to which it will engage in offensive cyber war. It's only relatively recently that the United States has admitted to or stated publicly that it's conducting offensive operations in the way Russia did in Georgia in the summer of 2008.

204 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Rafal Rohozinski).

205 Ibid.

206 Ibid.

207 Ibid.

208 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 1 May 2014 (Alexander Moens).

209 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

Canada needs to think about whether or not we're going to use cyber attacks as a form of warfare in the way we would use army, navy, and air.²¹⁰

In contrast, some witnesses held the view that the military should not take a lead role in cyber security in Canada. In discussing Cyber Command in the U.S, compared to a potential Cyber Command in Canada, Professor James Fergusson said that cyber security “is not a military function.” He added:

We are driven, as we always have been, by the United States. They set up a Cyber Command and somehow we think we should as well. Well, they are entirely different, those American motives and what's driving the United States, and what's driving our interests here.²¹¹

Some witnesses also spoke about the need to better control and regulate the telecommunication industry. According to a joint SecDev Foundation and Bell Canada study conducted a few years ago, between 5% and 12% of all computers and devices connected to the Internet belonged to a “botnet.” In other words, as Mr. Rohozinski stated, “they were under the control of some form of malfeasance software, which was not intended by the operator of the system itself.” This is a fairly significant problem. “The fact that we haven't regulated or incentivized the telecommunications industry to provide that first line of defence, I think, is one of the critical failures that we've had in addressing cyber security.”²¹² In his opinion, better coordination and cooperation between government organizations and the private sector would “go a long way to building a greater resilience into Canadian cyber space, increasing confidence, and minimizing the potential for catastrophic ... events.”²¹³ However, he told the Committee that Canada should be careful not to overregulate. “Greater security is not served by building digital borders, fences, or enclaves,” he said, explaining that the “Internet remains a useful intelligence-gathering tool, so we should not put too much restrictions and controls on it.”²¹⁴

5. Improving Defence Procurement

Another area of possible improvement identified by witnesses pertains to defence procurement. The Committee heard that in order to properly defend Canada and North America against new and emerging threats, the CAF need to remain at the forefront of defence technology. The army, navy and air force require access to the latest and most sophisticated weapon systems and military equipment available to be as efficient and effective as possible and capable of rapidly responding to any type of menace against the country or the continent. Professor James Fergusson stated that the defence of North America is not just about the air, land, sea, space and cyber domains, it is also about

210 Ibid.

211 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (James Fergusson).

212 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 20 November 2014 (Rafal Rohozinski).

213 Ibid.

214 Ibid.

“defence industrial [preparedness], defence technology, and research and development.”²¹⁵

Many of the threats Canada faces today from both state and non-state actors are technology based, regardless of whether they emanate from the use of aircraft, ships, submarines, missiles, weapons of mass destruction, or even computer systems. Likewise, monitoring Canadian territory and its air and maritime approaches and responding to those threats, in turn, requires the latest defence technology, including satellites, radars, sensors, communication systems, military aircraft, warships, submarines, armed vehicles, and other items. In order to remain at the forefront of defence technology, the CAF need to be backed by a well-functioning defence procurement system capable of rapidly supplying it with the weaponry and equipment required to properly defend all Canadians against new and emerging threats, whatever they might be.

However, problems and delays encountered with several defence procurement projects in recent years have raised concerns about the efficiency and effectiveness of Canada's defence procurement system, prompting several commentators to request reforms. The federal government responded in February 2014 with the unveiling of its Defence Procurement Strategy.²¹⁶ The new strategy has three key objectives: “delivering the right equipment of the Canadian Armed Forces ... in a timely manner; leveraging our purchases of defence equipment to create jobs and economic growth in Canada; and streamlining defence procurement processes.”²¹⁷

While witnesses agreed that the introduction of the Defence Procurement Strategy marked a step in the right direction, some believed there was still room for improvement. For example, Professor Ugurhan Berkok of the Royal Military College of Canada remarked that defence procurement in Canada remains a multi-departmental affair, involving the CAF and DND as well as Public Works and Government Services Canada (PWGSC), Industry Canada, and the Treasury Board of Canada. “Nobody else in the world has this” multi-departmental system, he pointed out.²¹⁸ Indeed, many countries use different approaches to defence procurement. Some of them, for example, have centralized their defence procurement processes within a single government organization, as is the case in Australia, the United Kingdom, France and several NATO countries.²¹⁹ The Defence Procurement Strategy, Professor Berkok suggested, did not address the issue of governance and accountability. While it has created a coordinating entity, a Defence Procurement Secretariat within PWGSC, the issue of having several federal government departments and agencies involved and accountable in the defence procurement process remains omnipresent. “If you have four boxes and you have a coordinating mechanism,”

215 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (James Fergusson).

216 Government of Canada, “[Leveraging Defence Procurement to Create Jobs and Benefit the Economy](#),” 7 February 2014.

217 Public Works and Government Services Canada (PWGSC), “[Defence Procurement Strategy](#).”

218 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 January 2015 (Ugurhan Berkok).

219 Martin Auger, [Defence Procurement Organizations: A Global Comparison](#), Background Paper, Publication No. 2014-82-E, Parliamentary Information and Research Service, Library of Parliament, Ottawa, 14 October 2014, pp. 1–15.

he said, “things will definitely be better, but the fundamental problem is that there are still four boxes and everything stops if there is one yes and one no.” In his view, “delays will arise out of this structure of governance.” He suggested instead that Canada consider centralizing defence procurement into a separate defence procurement agency or a crown corporation, as several of Canada’s allies have done in recent years.²²⁰

David Perry, on the other hand, did not believe that Canada should consider the centralized option yet. The defence procurement process, he told us, “has undergone some pretty significant evolution” and has “become more intergovernmental” with the introduction of the Defence Procurement Strategy. In his opinion, it will “take a long time before we can actually tell what the real impact of that [strategy] is going to be” on individual defence procurement projects, “probably a decade or so.”²²¹ That said, he maintained that the Defence Procurement Strategy could still be improved. In particular, he pointed to the need to increase the size and the capacity of the acquisition workforce.

The procurement workload has expanded significantly over the last decade [but] ... the acquisition workforce has not. The key departments—DND, Industry Canada, and Public Works and Government Services Canada—were all downsized substantially during program review in the 1990s. This left behind a much smaller and much less experienced workforce by the early 2000s. While procurement plans and budgets to fund them have increased since then, simply put, the workforce has not. As a result, the [Materiel] Group at DND is now managing essentially twice the workload that it was managing 20 years ago.²²²

Mr. Perry recommends that the acquisition workforce be “increased, with a particular focus on the [DND Materiel Group], major projects delivery organizations, Industry Canada’s Industrial and Technological Benefits branch, and the National Shipbuilding Procurement and Defence Procurement secretariats.” He said that “this should also be accompanied by corresponding increases in the capacity of the acquisition workforce by improving access to training opportunities, reducing the posting cycles for both public servants and military members into key acquisition position, and linking staff rotations to key project milestones.” Mr. Perry also recommended “that consideration be given to creating a dedicated non-command career path for procurement specialists in the Canadian military.”²²³

DEFENDING THE NORTH AMERICAN CONTINENT IN COOPERATION WITH THE UNITED STATES

A. The Canada-U.S. Defence Relationship

Canada and the U.S. have been cooperating in the defence of North America since the Second World War. The Canada-U.S. defence relationship has evolved in response to

220 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 January 2015 (Ugurhan Berkok).

221 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 January 2015 (David Perry).

222 Ibid.

223 Ibid. See also David Perry, [Putting the ‘Armed’ Back into the Canadian Armed Forces: Improving Defence Procurement in Canada](#), Conference of Defence Associations Institute, January 2015, pp. 21-22.

new threats and ongoing changes in the international security environment. The 11 September 2001 terrorist attacks, for example, have prompted the two countries to introduce a series of new measures and to create new government organizations such as Public Safety Canada and the U.S. Department of Homeland Security to protect North America from various asymmetric threats that could strike within their borders. It also prompted Canada and the U.S. to strengthen their defence relationship and to identify new ways to cooperate in the defence of North America. This has resulted, for instance, in the extension of NORAD's mission into the area of maritime warning in 2006 and in the establishment, in recent years, of various new binational defence forums, arrangements and agreements, in particular the Canada-U.S. Civil Assistance Plan in 2008, the Tri-Command Framework in 2009 and several other Tri-Command Cooperative Initiatives between 2010 and 2012, as well as the Combined Defence Plan in 2012.²²⁴

1. NORAD

NORAD remains by far one of the most important Canada-U.S. binational military organizations and continues to be relevant in the 21st Century. It is “far more than a close working relationship between the U.S. and Canada,” Major-General Wheeler told the Committee. “Rather, it is a full-fledged bi-national command, and arguably the world's most intimate military arrangement between two allies.”²²⁵ Professor Andrea Charron of the University of Manitoba stated that NORAD is incredibly important to Canada and the U.S., but “especially for Canada because of the geostrategic significance of this partnership and for the training opportunities and information it receives.”²²⁶

Under NORAD, Canadian and American military personnel jointly monitor North American skies 24 hour a day, 365 days a year. According to Major-General Wheeler “Our NORAD mission, in simple terms, is to watch the skies above our continent, and be ready to quickly and effectively respond to imminent security threats. It's a no-fail mission for us.”²²⁷ Lieutenant-General Parent said that NORAD's aerospace warning function largely consists of “processing, assessing, and disseminating intelligence and information related to manmade objects in the aerospace domain and the detection, validation, and warning of attack against North America whether by aircraft, missiles, or space vehicles.”²²⁸

Canada's contribution to NORAD consists of personnel, fighter aircraft and other air assets, as well as various infrastructures, notably radar stations.²²⁹ At the moment, more than 300 CAF members are assigned directly to NORAD functions, about 125 of them working at NORAD headquarters in Colorado Springs in the U.S. The remainder are

224 DND, [“Backgrounder: The Canada-U.S. Defence Relationship.”](#)

225 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

226 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (Andrea Charron).

227 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

228 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

229 Royal Canadian Air Force (RCAF), [“The North American Aerospace Defence Command \(NORAD\),”](#) modified 12 February 2015; RCAF, [“NORAD: Canada's Role in the Most Integrated Defence Partnership of the Modern Age,”](#) 14 October 2014.

assigned to various locations within the NORAD regions and sectors as well as to the NORAD Airborne Warning and Control Systems (AWACS) program.²³⁰ Under that program, Canadian and American military personnel work together onboard U.S.-based E-3 Sentry AWACS aircraft in support of continental defence operations.²³¹

There are three NORAD regions: the Continental U.S. NORAD Region (CONR) headquartered at Tyndall Air Force Base in Florida, the Alaskan NORAD Region (ANR) headquartered at Elmendorf Air Force Base in Alaska, and the Canadian NORAD Region (CANR) headquartered in Winnipeg, Manitoba.²³² CANR is responsible for the defence of Canada's airspace, which is a vast geographical area of responsibility that spreads from the Atlantic Ocean in the east to the Pacific Ocean in the west and from the U.S. border in the south to the northern tip of the Canadian Arctic archipelagoes in the north.²³³ Major-General Wheeler told the Committee that some 430 men and women from the CAF and the U.S. Air Force jointly "monitor the aerospace approaches to Canadian territory, identify all tracks in and around Canadian airspace, and stand ready to intercept and control aircraft that may be of concern to Canadian and North American security."²³⁴

The Canadian Air Defence Sector in North Bay, Ontario, is responsible for providing aerospace surveillance, identification, control and warning to CANR. This is achieved using information received from satellites, radar stations and AWACS aircraft. All aircraft detected by those systems in or near CANR are tracked by Canadian Air Defence Sector personnel. The integrated air picture gathered is then shared with CANR headquarters and the other NORAD regions, helping provide an overall picture of activities taking place in North American skies. "With that, we're pretty well capped," stated Major-General Wheeler. "We have a good understanding and situational awareness of the airspace throughout Canada and down in the United States, and we can respond to any abnormal situation with our fighter aircraft."²³⁵

If a potential threat emerges within the CANR area of responsibility, CANR headquarters, which is co-located with 1 Canadian Air Division, can deploy CF-18 jet fighters from 3 Wing Bagotville, Quebec, and 4 Wing Cold Lake, Alberta, to intercept. The two air bases maintain CF-18s on alert for short-notice NORAD missions 24 hours a day, 365 days a year. Other RCAF air assets can also be deployed if needed on NORAD missions. For example, CC-150 Polaris air-to-air refueling tanker aircraft stationed at 8 Wing in Trenton, Ontario, are often mobilized to refuel CF-18s engaged on long-range missions.²³⁶

230 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

231 RCAF, "[35 Years of Canadian Participation in NORAD AWACS Program](#)," 24 November 2014.

232 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

233 North American Aerospace Defence Command (NORAD), "[Canadian NORAD Region](#)."

234 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

235 Ibid.

236 RCAF, "[NORAD: Canada's Role in the Most Integrated Defence Partnership of the Modern Age](#)," 14 October 2014.

According to Major-General Wheeler, NORAD is the RCAF's "number one mission" and "will always be supported," regardless of budgetary challenges or participation in international military operations. "We make sure that we have the capability to sustain our NORAD mission first," he indicated. "From there we can determine how many aircraft crews ... we can deploy overseas." He told the Committee that the deployment of CF-18 fighters and RCAF personnel to Iraq and Syria (Operation IMPACT) and Europe (Operation REASSURANCE) "do not impact the missions we are conducting in Canada."²³⁷

Witnesses told the Committee how Canada benefits from its NORAD partnership with the U.S. Lieutenant-General Macdonald said:

We don't just work together; we operate in a fully integrated command. Tasks performed by Canadians and Americans are interwoven to the point where in most cases the nationality of the person performing them is immaterial. Canadians report to Americans and Americans report to Canadians throughout the structure. We share sensitive and highly classified information in order to perform the mission. We are dependent on each other even though the U.S. provides the majority of the resources. Throughout, the NORAD relationship engenders a level of trust that serves us well beyond NORAD issues. The success of the partnership and the professionalism of the Canadian military personnel have cemented personal relationships in both nations consistent with our inseparable domestic defence requirements. We Canadians benefit in the achievement of a priority national defence mission at a fraction of the cost were we required to do it on our own. Pursuing a natural evolution of the NORAD mission to retain its relevance and effectiveness must continue to be a priority.²³⁸

Major-General Wheeler shared a similar perspective. "Partnering with the U.S. has served us extremely well." According to Major-General Wheeler, NORAD allows Canada and the U.S. to "have the same tactics, techniques, and procedures," to "train together," to "fly the same way," to "[talk] to each other on a daily basis," and to "share information back and forth."²³⁹ NORAD also allows Canada to share air assets with the U.S. to fill important capability gaps. For example, Canada does not own any AWACS aircraft, but the U.S. does. Under the NORAD arrangement, the U.S. AWACS are used to extend the reach of land-based radar systems and the valuable information gathered by those aircraft is shared with Canada. Arrangements have also been made for U.S. air refueling aircraft to support Canadian CF-18 jet fighters when deployed on extended missions in the Arctic, thereby putting less pressure on the RCAF's small fleet of CC-150 Polaris air tankers.²⁴⁰ This is representative of the level of cooperation and collaboration that currently exists between Canada and the U.S. through NORAD.

NORAD is continually adapting to the international security environment and its various threats. When NORAD began in the 1950s, the main threat to North America came from long-range military aviation. This changed, however, in the 1960s with the

237 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

238 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Lieutenant-General George Macdonald).

239 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

240 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

advent of intercontinental ballistic missiles. Since then, the emergence of new threats has forced NORAD to further adapt. Before the 11 September 2001 terrorist attacks, for example, NORAD only focused on threats emanating from outside of North America. Only after those 2001 attacks did it start looking at threats emerging from inside the continent.²⁴¹

Major-General Wheeler said that, today, NORAD “monitor[s] all domestic air traffic and respond[s] to virtually any airborne threat that may put [Americans] and Canadians in harm's way.” This internal air defence mission is known as Operation NOBLE EAGLE.²⁴² It has been ongoing since September 2001 and is now a fixture of NORAD's mandate. The “commercial aviation threat” remains important, according to Lieutenant-General Parent. Al-Qaeda documents captured by U.S. forces when Osama bin Laden was killed in 2011 “mentioned a high interest in al-Qaeda to use aviation against North America, particularly general aviation.” He stated that a business jet could easily be “used as a missile” by terrorists.²⁴³

Lieutenant-General Parent indicated that security measures introduced by Canada and the U.S. since September 2001 would make it extremely difficult for terrorists to conduct successful air attacks against North America. “Before 9/11, we had stovepipes of excellence that were not necessarily sharing the information,” he stated. “Now we have these stovepipes communicating with each other, so that if somebody books an airplane ticket online, for example, and that person should not be travelling, there are law enforcement agencies that can start tracking” and preventing that person from boarding an aircraft.²⁴⁴ NORAD has contingency plans in place and is regularly training personnel to respond to internal security threats such as terrorism. Lieutenant-General Parent told Committee members that when the terrorist attack in Ottawa occurred on 22 October 2014, NORAD quickly responded by providing “overhead combat air patrols” and deployed additional combat aircraft to the air base in Trenton, Ontario, where they were placed on “high alert status,” ready to intervene if needed. These measures were rapidly implemented to “ensure any attempt to take advantage of the situation through the air would be foiled.”²⁴⁵

Another example of how NORAD continually adapts to a changing international security environment is the 2006 extension of its mission into the area of maritime warning. As a result of that binational decision, NORAD is today “processing, assessing, and disseminating intelligence and information related to the respective maritime areas and internal waterways and approaches to the U.S. and Canada,” Lieutenant-General Parent told the Committee. This information is principally transmitted to Canadian Joint Operations Command (CJOC) and U.S. Northern Command (USNORTHCOM), but also to other American and Canadian government organizations. According to Lieutenant-

241 Ibid.

242 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

243 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

244 Ibid.

245 Ibid.

General Parent, the decision to extend NORAD's early warning functions into the maritime domain has been a sound one. "While maritime threats may develop over a longer time period [than aerospace threats]," since "ships travel fairly slowly," he specified, "it's important to know that a seaborne threat can become an aerospace warning and defence issue with little warning." As he pointed out, chemical, biological, radiological and nuclear agents can all be transported by air or sea against North America. NORAD issued its first maritime advisory in 2010. Its annual number of maritime advisories has since grown, reaching 21 by 2014.²⁴⁶

It is clear that NORAD remains an important and valuable binational military organization that continuously helps protect Canada and the U.S. against a range of threats. Professor Andrea Charron said "NORAD is really the model for how Canada and U.S. organizations can work well together" and that the "amount of trust, training, and partnership that we have via this bi-national agreement is really the envy of many countries around the world."²⁴⁷ In her opinion, NORAD should continue to exist for years to come.

2. Canada-U.S. Civil Assistance Plan

Another way Canada and the U.S. have strengthened their defence relationship in recent years has been through the introduction of the Canada-U.S. Civil Assistance Plan in February 2008, which was renewed in January 2012. Major-General Coates defined the Canada-U.S. Civil Assistance Plan as a bilateral framework for the "provision of military support of one nation to support the military of the other nation, either during or in anticipation of a civil emergency." In essence, the plan "allows for scalable deployment of military personnel and assets" from one nation to the other in order to respond to various crises and events, such as floods, earthquakes, forest fires, and even the effects of a terrorist attack.²⁴⁸

All requests for assistance made under the Canada-U.S. Civil Assistance Plan must be approved by both the Canadian and U.S. governments. Only once that is obtained can military assets – whether they are personnel or equipment – be deployed from one country to another. "We would not respond unilaterally," Major-General Coates emphasized. The Canada-U.S. Civil Assistance Plan "just provides the framework."²⁴⁹ It should be stressed that Public Safety Canada and the U.S. Department of Homeland Security remain the lead government organizations for civil preparedness in Canada and the U.S. Military forces mobilized under the Canada-U.S. Civil Assistance Plan must operate at all times in support of civilian authorities.²⁵⁰

246 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

247 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (Andrea Charron).

248 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

249 Ibid.

250 DND, "[Backgrounder: The Canada-U.S. Defence Relationship](#)."

According to Major-General Coates, the plan has thus far been “successfully activated” on only two occasions. The first time occurred in 2008 when Hurricane Gustav struck the U.S. In that instance, Canada provided a CC-177 Globemaster III and two CC-130 Hercules transport aircraft to help evacuate medical patients from the southern United States and to support humanitarian assistance efforts. The other occurrence was in 2010 when Canada hosted the Winter Olympics in Vancouver, British Columbia. Major-General Coates clarified that for that occasion, USNORTHCOM was “proactively prepared to provide support for liaison teams and chemical, biological, radiological, and nuclear response forces should the unthinkable have occurred.”²⁵¹

3. The Tri-Command Structure

Another important way Canada and the U.S. have strengthened their defence relationship in recent years has been through the introduction of the Tri-Command Framework and other Tri-Command Cooperative Initiatives. Signed in September 2009, the Tri-Command Framework outlines how NORAD, USNORTHCOM and CJOC should operate, interact, and cooperate. According to DND, the Tri-Command Framework has improved “cooperation, efficiency and interoperability among the three commands.”²⁵² Major-General Coates elaborated on the benefits of the Tri-Command structure as follows:

We meet twice a year, with the staffs continually engaged between the three commands to work through matters of mutual interest. We share our contingency plans together, we exercise together, and we meet frequently as leadership ... We share our perception of threats; we share our understanding of what each of our capabilities are. Through our exercising together, we learn how to optimize our responses and maximize our capabilities.²⁵³

To further enhance cooperation and collaboration between the three commands, Major-General Coates indicated that about six binational working groups have been set up under the Tri-Command Framework, each focusing on specific areas of mutual interests, such as communications, hemispheric cooperation, and chemical, biological, radiological, and nuclear responses.²⁵⁴

Since 2009, Canada and the U.S. have strengthened the Tri-Command structure in a number of ways. In March 2010, the two countries signed the Tri-Command Vision, which provides a strategic view on how the three commands should cooperate. It also identified five strategic goals for the Tri-Command:

- Strengthen the collective ability to detect, deter, defend against, and defeat threats to our nations;
- Improve unity of effort with respective mission partners;

251 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

252 DND, “[Backgrounder: The Canada-U.S. Defence Relationship](#).”

253 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Major-General Christopher Coates).

254 Ibid.

- Develop a culture of continuous collaboration and cooperation in planning, execution, training, information management, and innovation;
- Enhance intelligence and information sharing and fusion to support mission accomplishment; and
- Strengthen the collective ability to provide appropriate, timely and effective support to civil authorities, when requested.²⁵⁵

Canada and the U.S. also signed a Tri-Command Strategy in December 2010, outlining a series of shared tasks designed to strengthen the Tri-Command working relationship with defence and security partners. This includes improving the ability to share classified information, conducting periodical reviews of the Canada-U.S. Civil Assistance Plan, sharing best practices and lessons learned, and improving shared situational awareness in the land, sea, air, space and cyber realms.²⁵⁶

More recently, in December 2012, Canada and the U.S. signed a Tri-Command Framework for Arctic Cooperation and a Tri-Command Training and Exercise Statement of Intent. According to DND, the purpose of the Tri-Command Framework for Arctic Cooperation is to enhance Tri-Command military cooperation in the Arctic in several areas, such as “planning, domain awareness, information-sharing, training and exercises, operations, capability development and science and technology.” The purpose of the Tri-Command Training and Exercise Statement of Intent, on the other hand, is to enhance joint Canada-U.S. military readiness through combined training and exercises.²⁵⁷

Lieutenant-General Beare said that the Tri-Command Structure is allowing NORAD, USNORTHCOM and CJOC to better communicate and support each other, thereby strengthening the ability of the American and Canadian militaries to jointly defend North America. As he informed the Committee:

We have been practicing how NORAD, NORTHCOM, and CJOC as commands, charged with similar but different defence missions, as a triad create something bigger than the sum of their parts ... Fundamentally, the missions that we perform individually and in a tri-command team have an effect in terms of defence, safety, and security on the continent, which more than the sum of its individual parts ... So the Tri-Command provides us a way of sharing our definition of what's going on as it relates to all missions. We're not tunnel-visioned on the threats or challenges to the continent. We're looking at all threats ... We're looking at all domains ... We're able to leverage one command or another's approach to dealing with specific challenges.²⁵⁸

Lieutenant-General Beare said that the 2012 renewal of the Canada-U.S. Civil Assistance Plan and introduction of a Combined Defence Plan – a binational planning framework for enhance defence cooperation between Canada and the U.S. – has

255 DND, “[Backgrounder: The Canada-U.S. Defence Relationship](#).”

256 Ibid.

257 Ibid.

258 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 13 May 2014 (Lieutenant-General Stuart Beare).

significantly enhanced the efficiency of the Tri-Command structure. “Those pre-existing arrangements,” he pointed out, “allow us to leverage each other's capabilities for individual or collective benefit. We don't just talk about it, we practice it. We practice it as operational commands and we practice it from time to time in the field.”²⁵⁹

B. Strengthening Continental Security in Cooperation with the United States

In the course of this study, the Committee was made aware of a number of areas where the Canada-U.S. defence relationship could be strengthened and improved. Paul Stockton, former U.S. Assistant Secretary of Defense for Homeland Defense and America's Security Affairs (2009-2013), told the Committee: “Canadian-U.S. defence collaboration is extraordinary, and extraordinarily valuable,” but there are still “opportunities to deepen and broaden this collaboration into new security realms.”²⁶⁰

1. Expanding NORAD and its Domain Awareness Capabilities

In the course of this study, the Committee heard numerous accounts on the continued importance and relevance of NORAD as a binational military organization in the 21st Century. Yet, most witnesses agreed that NORAD could be improved and strengthened to deal more effectively with the various threats faced by Canada and the U.S.

NORAD's maritime warning function was identified as an area of possible improvement. Lieutenant-General Parent told the Committee that “maritime alert and maritime warning and information exchange ... can always be better.” In his view, the “challenge is to make sure every stakeholder [in maritime domain awareness] ... has a habitual relationship with NORAD in sharing that information, so that our job is really to fuse the information to make sure nobody misses anything.” Lieutenant-General Parent said that the relationship between NORAD and the various maritime domain stakeholders remains “evolutionary” and NORAD's maritime warning role is a “work in progress.”²⁶¹ Professor Andrea Charron stated to the Committee that the “NORAD maritime warning mission is new and is not as mature and well-resourced as the air warning and control functions.”²⁶²

NORAD is currently in the process of reviewing its capabilities to respond to new and emerging threats. Under the NORAD Next initiative, the American and Canadian governments are conducting an analysis of the emerging challenges and threats facing Canada and the U.S. in the decades ahead and investigating the capabilities NORAD will

259 Ibid.

260 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 6 May 2014 (Paul Stockton).

261 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

262 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (Andrea Charron).

need to confront such emerging threats. This includes identifying steps that should be taken now to prepare for those future challenges and threats.²⁶³

Lieutenant-General Parent said that “threats to our national security are becoming more diffuse and less attributable ... North America is increasingly vulnerable to an array of evolving threats, state or non-state, traditional or asymmetric, across all the domains of air, land, sea, space, and cyber space.” He also noted that “regional conflicts can rapidly expand to have global implications and even impact the homeland.” As an example, he pointed to the recent Syrian civil war and how NORAD became increasingly concerned about the “possibility of cyber attacks on North America” after Canada, the U.S. and the rest of the international community denounced the Bashar al-Assad regime.²⁶⁴

During their committee appearance Professors Andrea Charron and James Fergusson outlined four major options for NORAD going forward:

- Option 1: That NORAD maintains the status quo by continuing to effectively deliver on its aerospace warning, control and response mission, and by further developing its new maritime warning mandate;
- Option 2: That NORAD reverts to its original mandate and drops the maritime warning mission;
- Option 3: That NORAD expands its early warning and attack assessment mission to include all environments – air, space, maritime, land, and cyber – for all of North America; and
- Option 4: That NORAD becomes an all-domain early warning *and* all-domain operational response command.²⁶⁵

According to Professor Charron, NORAD “can provide all-domain awareness.”²⁶⁶ Professor Fergusson agrees. “I’m on centralized ... all-domain awareness from a North American perspective,” he told Committee members. In his view, the ideal solution would be to “gradually expand NORAD, at a minimum to provide all the main awareness for land, sea, air, space, and potentially cyber ... so that you have all-domain awareness, and then leave the responses, except air, because it already been in place, to national and bilateral approaches.”²⁶⁷

Professor Philippe Lagassé, of the University of Ottawa, said that the time has come to “consider an expansion of NORAD to include a veritable bi-national approach to

263 Donna Miles, “[U.S., Canada Think Ahead to ‘NORAD Next’](#),” *American Forces Press Service*, 7 January 2013.

264 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

265 Andrea Charron and Jim Fergusson, [NORAD in Perpetuity? Challenges and Opportunities for Canada](#), Centre for Defence and Security Studies, University of Manitoba, 31 March 2014.

266 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (Andrea Charron).

267 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (James Fergusson).

the defence of North America, on land, at sea, in the cyber realm and in the Arctic.”²⁶⁸
In his opinion:

An expanded NORAD would arguably be more efficient and cost-effective than the current bi-national approach to continental defence cooperation in these areas. As well an enlarged NORAD would be better prepared to address potential threats to the continent, particularly in the cyber realm and in the Arctic.²⁶⁹

However, expanding NORAD into other environments could be complex and might entail a complete overhaul of that binational military organization. Professor Charron used the example of expansion into the cyber domain. “Right now NORAD’s requirement is to protect NORAD assets,” she said. “Whether or not [NORAD] should be responsible for tracking other cyber security threats – for instance, civilian apparatus – it would mean that we need to change the nature of NORAD and the command and control structures to be able to do that.”²⁷⁰

Not all witnesses believed that NORAD should expand into other environments. “There are ... some potential problems with building incrementally on the NORAD template,” Brian Bow, a Fellow with the CDFAI, said.

First, NORAD is an air force institution ... and using it as the foundation for a broader, multi-domain structure creates the potential for, or at least the potential perception of, an imbalance of influence. That has been an issue in the effort to build a maritime NORAD as the already difficult bureaucratic process of bringing together many different departments under one umbrella has been further complicated by the perception among some of the participating departments and agencies that the RCAF and USAF are poaching on others’ turf ... Second ... the contemporary Tri-Command structure may tend to sustain an unhealthy division of labour between the services, which may exacerbate turf battles and raise questions about overlap and redundancy ... Third, the branding of new forms of bilateral defence coordination as extensions of NORAD may tend to obscure the fact that these new initiatives are not nearly as integrated as NORAD itself.²⁷¹

According to Mr. Bow, NORAD should restrict itself to the aerospace environment. In his view, it would be preferable to create separate integrated binational structures to properly deal with the other environments, particularly the maritime domain.²⁷² Canada and the U.S., he said, should think about establishing a maritime equivalent to NORAD.

If Canada is willing to make significant investments over the next few years to try to harden the outer edges of the continental security perimeter, it may find the United States receptive to the creation of new integrated structures, especially with respect to the

268 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Philippe Lagassé).

269 Ibid.

270 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (Andrea Charron).

271 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Brian Bow).

272 Ibid.

surveillance and control of maritime approaches, inland waterways, shipping, and other cross-border transportation systems.²⁷³

Some witnesses identified the replacement of aging NORAD infrastructures and surveillance and communications systems in the North as a priority. According to a recent NORAD strategic review completed in December 2014, the organization requires improved sensors, communication systems and infrastructure in the high north in order to remain “relevant and effective.”²⁷⁴

The Committee was told of a need to renew the aging North Warning System radar network, which is approaching the end of its operational life.²⁷⁵

According to Lieutenant-General Parent, Canada and the U.S. should decide soon on whether to refurbish or replace the North Warning System.

We expect its [North Warning System] life expectancy to be 2025 to 2030. It really takes a long time to build in the north and given that we need to study what is the best system of systems to replace that system and refurbish it—it could be space-based, it could be land-based, it could be maritime-based—we need to talk about the replacement of the North Warning System in the north now.²⁷⁶

Professor Charron agreed and suggested that the North Warning System “has been and still is one of the best sources of information for NORAD.” In her view, a decision to renew the aging North Warning System should be taken as soon as possible to avoid potential problems with its aging infrastructures and systems.

My concern is that if something happens to the North Warning System—and remember, we've already had one of their radar sites burn to the ground—or if there is an interruption of the feed by the North Warning System, that really would impinge on the ability of NORAD to see what is going on.²⁷⁷

Some witnesses also suggested that Canada and the U.S. should reconsider the present location of the North Warning System. The North Warning System “is not necessarily in the right place,” Lieutenant-General Parent said. “Right now it does not cover the entirety of the Canadian sovereign territory.”²⁷⁸ The Committee was told that the North Warning System is located too far south and, as such, does not cover a large portion of northern Canada. Professors Charron and Fergusson both believe that the North

273 Ibid.

274 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

275 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 16 February 2015 (Major-General D.L.R. Wheeler).

276 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

277 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (Andrea Charron).

278 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

Warning System's replacement should be relocated to properly capture incursions occurring farther North.²⁷⁹

When asked whether the North Warning System should be replaced by space-based technology, Professor Fergusson talked about the relatively short life-expectancy of satellites compared to radar stations. The North Warning System, he stated, was modernized in the 1980's and it is still functioning more than 30 years later. "Satellites don't last 30 years," he said. "You have to replace them in five to ten years, depending on how lucky you are relative to the harsh environment in outer space."²⁸⁰

Some witnesses also expressed the view that new and improved communications as well as command and control infrastructures were needed in the North.²⁸¹

2. Reviewing the Tri-Command Structure

The Committee heard of possible improvements to the Tri-Command structure. Several witnesses felt that the current relationship between NORAD, USNORTHCOM and CJOC has its problems and could be improved. Brian Bow said that Canada should be re-examining the "overall architecture of [its] defence cooperation with the United States." Since the terrorist attacks of 11 September 2001 the American and Canadian "approach to continental defence" has been centered on NORAD and the establishment of several separate national command structures, such as USNORTHCOM and CJOC. Mr. Bow stated:

While NORAD persists as an integrated command structure within a particular domain, the main trend since 9/11 has been a reliance on building up separate national command structures and capabilities ... Rather than thinking about how to develop a more integrated command structure that would bridge many domains, the focus has been on trying to make the commands we already have—NORTHCOM, NORAD, and CJOC—work together more efficiently, that is, the tri-command system ... Where efforts have been made to pursue more integrated forms of coordination, they have taken the form of ad hoc extensions of NORAD to other domains [for example, NORAD maritime warning functions].²⁸²

Mr. Bow recommended the establishment of "new integrated structures" between Canada and the U.S. that could facilitate "greater consultation, intelligence sharing and financial resources."²⁸³

Professor Fergusson stated that Canada and the U.S. should investigate "whether the current structure of the relationship concerning the defence of North America,

279 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (Andrea Charron and James Fergusson); Andrea Charron and Jim Fergusson, [NORAD in Perpetuity? Challenges and Opportunities for Canada](#), Centre for Defence and Security Studies, University of Manitoba, 31 March 2014.

280 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (James Fergusson).

281 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 23 February 2015 (Brigadier-General G.D. Loos).

282 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Brian Bow).

283 Ibid.

dominated by bilateral arrangements relative to the three existing bi-national missions, is functionally efficient and effective.”²⁸⁴

3. Improving Cooperation in Times of Civil Emergencies

Some witnesses also suggested that the armed forces of Canada and the U.S. enhance their level of cooperation in the area of military aid to civilian authorities, particularly in times of national or continental emergency

Paul Stockton stated that Canada and the U.S. should expand their defence relationship through “deeper collaboration” in the area of disaster relief in the event of North American critical infrastructure shutdowns. Canada and the U.S., he said, share extensive interconnections in natural gas infrastructure, electricity infrastructure, and other forms of critical infrastructure.²⁸⁵ These infrastructures, however, are vulnerable to new and emerging threats, such as cyber warfare and terrorism. “It is inevitable that a successful cyber attack will occur on the electric, natural gas, or other energy infrastructure on which both our nations depend,” Mr. Stockton told the Committee, adding that on a daily basis:

Efforts are under way to penetrate the networks on which our energy infrastructure depends. The computer networks are under attack today, both to map those networks, to steal valuable data, and potentially to launch attacks on the industrial control systems, the other mechanisms that provide for the functioning of this critical infrastructure.²⁸⁶

Although Public Safety Canada and the U.S. Department of Homeland Security have “primary responsibility” for the “cyber security of the electrical power grid and other critical infrastructure” in Canada and the U.S., Mr. Stockton argued that the “resilience of critical infrastructure is increasingly important” to the American and Canadian militaries.²⁸⁷

As a case in point, Mr. Stockton told the Committee that the U.S. Department of Defense depends on the electric power industry for 99% of the electricity that it uses. “If the electric power grid goes down for an extended period in the United States,” he said, “very quickly the ability of U.S. military facilities to execute their responsibilities to the nation could be in jeopardy.” It could even affect the military’s capacity to provide support to civil authorities and conduct disaster response operations. As a result, Mr. Stockton said, “providing that assistance will be much more difficult because the environment in which we’ll be trying to provide disaster assistance will be so severely disrupted.”²⁸⁸

When Hurricane Sandy caused major power outages in New York and New Jersey in 2012, gas pumps, dependent on electricity to function, were drastically affected. This, in turn, created a logistical nightmare for emergency crews, since fuel to power their vehicles

284 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 28 October 2014 (James Fergusson).

285 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 6 May 2014 (Paul Stockton).

286 Ibid.

287 Ibid.

288 Ibid.

in the disaster area needed to be imported. As Mr. Stockton told the Committee, during Hurricane Sandy, “emergency vehicles, police cars, and everything else that [was] needed in order to provide for life-saving and rescue operations, couldn’t get the fuel they needed unless the Department of Defense brought it forward.” The U.S. military actually “provided millions of gallons of fuel and many, many hundreds of emergency generators in order to keep hospitals, nursing homes, and other facilities critical to saving and sustaining lives up and running when the power grid went down for two weeks.” The military also “flew hundreds of utility trucks and power restorations crews from the West coast to New York and New Jersey to accelerate power restoration.”²⁸⁹

The onset of cyber and terrorist threats has increased the risks of severe power outages. A successful cyber or terrorist attack on American and Canadian critical infrastructures, for instance, could cause, according to Mr Stockton, “an electric power outage of a length and duration that could dwarf the outage caused by superstorm Sandy or any previous event.” If such a scenario transpired, the demand on the American and Canadian militaries to “help save and sustain lives, to provide defence support to civil authorities could be much, much greater.”²⁹⁰

In Mr. Stockton’s opinion, the vulnerabilities of the American and Canadian armed forces to an “asymmetric attack ... on the critical infrastructures” of Canada and the U.S. on which they depend need to be investigated more thoroughly. This is where opportunities for defence collaboration can occur. In his view, there needs to be enhanced binational collaboration and mutual support between the two respective militaries so that they can better “support each other if a disaster occurs in Canada, or if a disaster occurs in the United States.” He said that “the future of our defence collaboration is not only military NORAD-type issues but defence support to civil authorities ... in critical infrastructure protection” and “disaster response.”²⁹¹

In Mr. Stockton’s view, the Canada-U.S. Civil Assistance Plan provides a “strong foundation on which to build,” but more needs to be done. “It’s in the planning realm that I think the greatest progress can go forward.” There are “opportunities to have collaborative investment strategies,” he said, and “to partner together” to ensure a more efficient and effective use of American and Canadian defence resources in times of national or continental emergency. Mr. Stockton believes this could take the form of a binational agreement that would highlight in advance what each country can provide in terms of capabilities in order to avoid having to make “things up under duress” and “all rushing to the site in an uncoordinated fashion” when the next catastrophe strikes in North America. Such an agreement would also facilitate the movement of American and Canadian military assets across the border to provide assistance. Mr. Stockton said one key lesson from superstorm Sandy was the lack of a binational agreement that would allow Canadian civilian or military personnel to easily come across the border to provide assistance to U.S.

289 Ibid.

290 Ibid.

291 Ibid.

authorities, and vice versa. “There were too many impediments, too many delays,” he said.²⁹²

4. Arctic Cooperation

Many witnesses believed that Canada and the U.S. should increase their level of cooperation in the Arctic. According to Professor Christopher Sands, the two countries should start by resolving their differences over the North West Passage and their boundary dispute in the Beaufort Sea. “Despite all of our differences in the Arctic,” he said, “Canada and the U.S. are fundamentally friends ... as long as the U.S. and Canada have been working at cross purposes in the Arctic, it has emboldened the Russians and ... others to try to map out a new regime in the Arctic, to our detriment.”²⁹³

Professor Charles Doran said that Canada and the U.S. are not taking the “Arctic seriously in defence terms” and that the two countries have good reasons to seek “greater cooperation and coordination” of their security and monitoring activities in the Arctic as movement of ships increase in the region. “It is an area that has to be examined in terms of what the terrorist implications might be. It's frightening to see how close Hudson Bay is to the cities, the heartland, of Canada and the United States. These areas can in fact be increasingly penetrated, not just by submarines but by surface ships.”²⁹⁴

According to Professor Elinor Sloan, it is imperative that both Canada and the U.S. find a way to work cooperatively in the Arctic. Canada, she said, should begin to actively consult with the U.S. now in order to find ways of working together to strengthen “surveillance and control” capabilities in the Arctic.²⁹⁵ Professor Sands agreed when he pointed out that Canada and the U.S. are currently “duplicating efforts in terms of [their] ability to provide security in the Arctic” and are “working at cross-purposes when [they] should be working together.”²⁹⁶

Professor Philippe Lagassé told the Committee that enhanced cooperation between Canada and the U.S. in the Arctic would allow the two countries to combine resources and better monitor foreign activities in that region.

Were we to try to work with the United States in a more coordinated fashion when it came to the Arctic, they would be able to invest more with us in developing additional space-based and radar capabilities to enhance that. One might even argue that were we to take a bi-national approach to the Arctic, we would arguably have a better understanding of where submarines are using their assets, even if they do not divulge to us precisely where their submarines are. It would to some degree give us a better understanding of the threats and the nature of those ships that are approaching us.²⁹⁷

292 Ibid.

293 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 4 December 2014 (Christopher Sands).

294 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 4 December 2014 (Charles Doran).

295 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

296 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 4 December 2014 (Christopher Sands).

297 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Philippe Lagassé).

Professor Stéphane Roussel said that the Tri-Command Framework for Arctic Cooperation that was signed in 2012 represents a “step in the right direction” and that more needs to be done. He recommended that Canada and the U.S. establish a joint Canada-U.S. advisory committee on matters of security in the north that would function as follow:

This would be a type of permanent joint committee on northern defence which would resemble a parity committee. Its mandate would be to explore matters of security that are of concern to both countries and to make recommendations to both governments. The committee would not be a decision-making body, but it would have the power to make recommendations.²⁹⁸

5. Cyber Defence Cooperation

Several witnesses argued that there are serious discrepancies between Canada and the U.S. in the area of cyber defence. Professor Sloan told the Committee that “there appears to be an asymmetry in approach between Canada and the United States when it comes to cyber defence.”²⁹⁹

The U.S. military has created a separate Cyber Command that had been given specific responsibilities in the defence of U.S. critical infrastructure and of the homeland. By contrast, Canada’s 2010 Cyber Security Strategy assigns Public Safety as the lead agency. It is not clear what role defence will play in response to a cyber event in Canada beyond the fact that it is responsible for defending its own networks.³⁰⁰

According to Lieutenant-General George Macdonald, Canada is less ready to deal with cyber attacks than the U.S. as a result of those discrepancies:

We in Canada, I think, are somewhat behind the eight ball here. We haven't progressed as much as the Americans have in cyber command. The interconnectedness of our economies and our infrastructure should be a wake-up call, I think, for us to take very seriously the potential of a debilitating attack.³⁰¹

In his view, there should be closer cooperation between Canada and the U.S. on the cyber security front. Other witnesses agreed. “With regard to cyber security coordination,” Professor Sands told the Committee that, “the key is for our officials on the cyber defence side to talk to each other, do a bit more war-gaming, and try to prepare.” What Canada and the U.S. “need to develop in tandem is both the capacity to look ... deep into the Internet,” into the so-called “deep web” or “dark net,” which is that portion of the World Wide Web that is not indexed by standard search engines and which is often used by terrorists and criminals, and the “capacity to govern our searchers.”³⁰²

298 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 29 April 2014 (Stéphane Roussel).

299 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Elinor Sloan).

300 Ibid.

301 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Lieutenant-General George Macdonald).

302 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 4 December 2014 (Christopher Sands).

Lieutenant-General Parent told the Committee that Canada and the U.S. do as much as they can to cooperate bilaterally on the cyber front, but “there is still a long road to travel before we go in a bi-national manner in the cyber domain,” noting that “in terms of cyber ... the responsibility for Canada rests with Public Safety Canada, and for the U.S. with the Department of Homeland Security.” He suggested that if Canada and the U.S. eventually decided to combat cyber threats in a binational fashion, this should be done through NORAD. It “would be wise to have NORAD evolve into the cyber domain, instead of creating a separate agency, and deal with cyber in a bi-national fashion.”³⁰³

However, not all witnesses agreed with the notion that enhancing American and Canadian cooperation in the cyber realm should be under NORAD authority or another joint binational entity. Brian Bow, for example, argued that the two countries should continue on their separate paths and cooperate within that framework:

I don't know that there's any obvious basis for a much closer coordination with the Americans ... We have clearly started out on separate tracks, and there are good reasons to maintain a separate approach, but there are probably plenty of ways in which there could be ad hoc cooperation, where [you would] know about the potential for a certain kind of attack and if there's a way to even model your response on what the Americans do or at least share intelligence about that kind of thing.³⁰⁴

6. Participating in Ballistic Missile Defence

In February 2005, the Canadian government announced that Canada would not join the U.S. in a Ballistic Missile Defence (BMD) program.³⁰⁵ However, in recent years, there has been renewed debate on whether or not Canada should participate with the U.S. in BMD. The Committee did not convene any formal panels specifically on BMD, but several witnesses offered their views in support of Canada's participation. Other proposed witnesses who were of the view that Canada should not participate in BMD with the U.S., did not appear before the Committee, but some appeared before the Standing Senate Committee on National Security and Defence.³⁰⁶

According to Professor Frank Harvey, there is “puzzling inconsistency in Canada's policy on ballistic missile defence.” While the Canadian government supports NATO's 2010 decision to develop a BMD capability to protect NATO European territory, populations and military forces, it “continues to shy away from embracing the utility of bilateral negotiations with the U.S. to protect Canada.”³⁰⁷ He said that, unlike the U.S. and NATO allies, Canada has “the luxury of ignoring the BMD and ballistic missile threat files”

303 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 9 March 2015 (Lieutenant-General J.A.J. Parent).

304 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Brian Bow).

305 House of Commons, [Debates](#), 1st Session, 38th Parliament, 24 February 2005, p. 3910.

306 For example, see Standing Senate Committee on National Security and Defence, [Canada and Ballistic Missile Defence: Responding to the Evolving Threat](#), June 2014, pp. 1-21; David S. McDonough, [Back to the Future: Debating Missile Defence in Canada ... Again](#), Canadian Defence and Foreign Affairs Institute (CDFAI), June 2013, pp. 1-7.

307 Document prepared by Frank P. Harvey and distributed to the House of Commons Standing Committee on National Defence on 9 May 2014.

because of its shared continental defence relationship with the U.S. and the assumption that U.S. military forces will protect it from any incoming missiles. In his view, this represents “a very risky abrogation of the [federal] government’s core obligation to proactively protect Canadians from ‘grave’ ballistic missile threats the government (and our allies) have already acknowledged are real and getting worse.” In his opinion, “Ottawa should engage in high-level consultations with Washington on BMD.”³⁰⁸

Colin Robertson stated his view that the international security environment has changed since 2005 and that new threats have emerged:

It's time for Canada to find shelter under the umbrella of ballistic missile defence, because the threat assessment has changed. First, North Korea has developed a rogue mobile ballistic missile capacity that's intended to target the U.S.A. But given its wonky aim ... it could just as easily hit Canada with nuclear warheads. Second, Iran has an arsenal of ballistic missiles and is steadily working towards an intercontinental capability.³⁰⁹

Mr. Robertson stated his opinion that BMD would be the wise thing to do in light of those threats, and the possibility of emerging threats in coming years from “new bad actors with access to warheads, intercontinental missiles and weapons of mass destruction.”

BMD is a proportional and prudent response to practical tangible threats. It has been endorsed already by our 27 partners in NATO and our friends and allies in Indo-Pacific, Australia, Japan, and South Korea. We share information and early warning and risk assessment with the United States through our participation in NORAD. It seems ludicrous, but when it comes time to make critical [BMD] ... decisions, our officials literally have to leave the room. The algorithms developed by U.S. northern command to protect the American homeland do not include Canadian cities like Edmonton or Saskatoon. Without our participation the U.S. has no political or moral obligation to defend Canada.... Accession to a ballistic missile defence program is the best insurance to protect Canadians.³¹⁰

Professor Philippe Lagassé stated that the time has come for Canada to explore “joining its fellow allies in fully accepting the logic of maintaining BMDs.”³¹¹ From his perspective:

Canada’s current abstention acts as an obstacle toward closer cooperation within the existing NORAD construct, it restricts Canada’s access to information and technologies that arguably serve the national interests, and it could make Canada more vulnerable in future decades as ballistic missiles proliferate.³¹²

Ferry de Kerckhove expressed a similar view to the Committee:

308 Ibid.

309 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson).

310 Ibid.

311 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Philippe Lagassé).

312 Ibid.

To me, it's a very simple answer. We are in it together. We are doing North American defence together, and we participate in the means that are available to do so. It is utterly contradictory to do it [BMD] in Europe and not to do it within our own territory ... I think our interests and even our sovereignty would be better served by joining the U.S. on BMD rather than staying aloof.³¹³

Professor Alexander Moens said that “Canada has a moral obligation to be part of the defence of North America against nuclear blackmail” and that “missile defence is not an ideology but a practical military option.”³¹⁴

Some witnesses were of the opinion that BMD is a natural extension of NORAD and that not participating in it is detrimental to Canada. Lieutenant-General Macdonald said:

We subscribe to the necessity of the alliance [NORAD] to defend North America and yet we have abrogated our responsibility to the partnership with regard to the BMD mission. We have left it to the American side of NORAD to perform using their territory, their resources, and their rules. With improvements to the BMD system over the years there's a real risk that NORAD involvement will be marginalized to the point where the U.S. will want to consider excluding NORAD from missile warning altogether and simply execute both the warning and the defence mission themselves. I believe that we should engage the U.S. to assess how we might become involved. It is the responsible course of action for Canada.³¹⁵

Lieutenant-General Macdonald said that Canada should reconsider involvement in the North American BMD system. The more we wait, he said, the more difficult it will be for us to join.

I think there will come a time when we will find ourselves in a position where we will have missed that opportunity and it will be difficult for us to re-engage—to the detriment, I think, of the integrity of our NORAD participation.³¹⁶

The Committee heard differing views on the financial cost and staffing requirements of BMD participation. Professor Lagassé said that Canada could join the U.S. BMD program at “practically ... no costs for Canada ... if we maintain the condition whereby Canada's participation does not involve any costs, the staff already on site [i.e., NORAD] is used and no facilities are planned on Canadian soil, we would just be using the existing resources.”³¹⁷ Colin Robertson held a similar opinion and summarized his conversations with Americans experts on the matter: “Since they have already constructed the building [BMD systems and infrastructures], it's felt that the costs would be minimal because it's already been done.”³¹⁸

313 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (Ferry de Kerckhove).

314 NDDN, [Blues](#), 2nd Session, 41st Parliament, 1 May 2014 (Alexander Moens).

315 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 30 October 2014 (Lieutenant-General George Macdonald).

316 Ibid.

317 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 25 March 2014 (Philippe Lagassé).

318 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 8 May 2014 (Colin Robertson).

Other witnesses had different perspectives on the issue of cost. Ferry de Kerckhove said, “if we work with the Americans, I would find it surprising if we were not called on to contribute in one way or another, whether on a technical and financial level or in terms of staffing, the same way we do with NORAD.”³¹⁹ Professor Moens stated that “Canada’s entry into missile defence should not be cost-free but include an ongoing contribution and bring about substantial participation.”³²⁰

CONCLUDING REMARKS AND RECOMMENDATIONS

Over the course of this study, the Committee gained a better understanding of how the CAF defends Canada and contributes to the defence of North America in cooperation with the U.S. It learned about the evolving international security environment and the various threats Canada and the U.S. currently face. It also learned a great deal about how the two countries are working together to protect the continent they share from those threats. The Committee was particularly impressed with the high state of readiness of the CAF and its capacity to defend Canada independently. Our women and men in uniform stand ready to protect our country, our freedom and our way of life 24 hours per day, 365 days per year. The Committee is extremely proud and grateful of the hard, challenging, and often dangerous work they do.

However, the Committee believes that there are still areas where more could be done to improve and strengthen the defence of Canada and North America. Although the Canada-U.S. defence relationship is strong and healthy, the Committee believes there are areas where there can be increased cooperation between the two countries. Likewise, the Committee believes that there are ways in which Canada can better contribute to the defence of its sovereign territory.

Therefore, the Committee makes the following recommendations to the Government of Canada to improve the defence of Canada and enhance our partnership with the U.S. in the defence of North America.

- 1. The Committee recommends that the Government of Canada ensures the proper surveillance safeguards and operational measures are in place to protect our northern sovereignty.**
- 2. The Committee recommends that the Government of Canada consider a plan to replace the North Warning System or extend the infrastructure’s operational life cycle and expand the system to cover Canada’s archipelago.**
- 3. The Committee recommends that the Government of Canada consider the use of unmanned and unarmed aerial vehicles (UAVs) for the surveillance of Canadian Arctic territory.**

319 NDDN, [Evidence](#), 2nd Session, 41st Parliament, 10 April 2014 (Ferry de Kerckhove).

320 NDDN, [Blues](#), 2nd Session, 41st Parliament, 1 May 2014 (Alexander Moens).

- 4. The Committee recommends that the Government of Canada, both, independently and through its NORAD partnership, continue to strengthen its domain awareness and surveillance operations of any threats to Canada and North America, focusing on the Arctic and maritime domains.**
- 5. The Committee recommends that the Government of Canada conduct an assessment of the skills and talents available through the Reserves to have a more comprehensive understanding of how the Reserves can fill gaps within the regular forces.**
- 6. The Committee recommends that the Canadian Armed Forces maintain its relationship with local communities through the Reserves and the Canadian Rangers programs.**
- 7. The Committee recommends that the Government of Canada establish provisions to ensure that the Canadian Armed Forces Reserves receive stable funding.**
- 8. The Committee recommends that the Government of Canada strengthen the Cadet program with a sufficient number of administrators and instructors to ensure that all participants receive valuable training and a safe educational experience.**
- 9. The Committee recommends that the Government of Canada ensure that the Canadian Armed Forces' Search and Rescue operations have the equipment necessary to maintain a high state of readiness and response posture.**
- 10. The Committee recommends that the Government of Canada increase the size and capacity of the acquisition workforce and commit to increasing investment in training and qualification and the length of military postings in acquisition-related positions in order to create a more efficient procurement process.**
- 11. The Committee recommends that the Government of Canada continue modernization projects of current infrastructure to ensure that members of the CAF have the most advanced equipment necessary to carry out their operations.**
- 12. The Committee recommends that the Government of Canada continue to ensure members of the Royal Canadian Navy are properly equipped by remaining committed to the National Shipbuilding Procurement Strategy and the Navy Renewal Program.**
- 13. The Committee recommends that the Government of Canada give priority to ensuring that Canada has adequate icebreaking capabilities, and that these capabilities be put in place as soon as possible.**

14. The Committee recommends that the Government of Canada replace the current fleet of CF-18's before they reach the end of their current expanded operational life cycle.

15. The Committee recommends that the Government of Canada continue to strengthen efforts to combat terrorism at home and abroad.

16. The Committee recommends that the Government of Canada maintain a robust recruitment program for the Canadian Armed Forces Regular Force and the Reserves.

17. The Committee recommends that the Government of Canada prioritize the need for reducing recruitment processing times for potential Reservists and Regular Force members to ensure that these recruits are processed while their interest in serving in the Canadian Armed Forces remains.

18. The Committee recommends that the Government of Canada ensure that adequate safeguards are in place to protect Canada and Canadians from cyber attacks by foreign governments or non-state actors.

APPENDIX A

LIST OF WITNESSES

41st Parliament – Second Session	Date	Meeting
Organizations and Individuals		
As individuals	2014/03/25	15
Philippe Lagassé, Associate Professor Public and International Affairs, University of Ottawa		
Elinor Sloan, Professor Department of Political Science, Carleton University		
Department of Foreign Affairs, Trade and Development	2014/03/27	16
Artur Wilczynski, Director General International Security and Intelligence Bureau		
Department of National Defence		
MGen Christian Rousseau, Chief Defence intelligence, Canadian Armed Forces		
Jill Sinclair, Assistant Deputy Minister Policy, Canadian Armed Forces		
Conference of Defence Associations Institute	2014/04/10	20
Ferry de Kerckhove, Executive Vice-President Co-author, Strategic Outlook for Canada 2014: A Search for Leadership		
George Petrolekas, Director of the Board of Directors Co-author, Strategic Outlook for Canada 2014: A Search for Leadership		
As an individual	2014/04/29	21
Stéphane Roussel, Professor École nationale d'administration publique		
As individuals	2014/05/01	22
Alexander Moens, Professor Political Science, Simon Fraser University		
Stephen Saideman, Paterson Chair in International Affairs, Norman Paterson School of International Affairs, Carleton University		
As an individual	2014/05/06	23
Paul Stockton, Managing Director Sonecon, LLC		
Canadian Defence and Foreign Affairs Institute	2014/05/08	24
Colin Robertson, Vice-President		
As an individual		
Aurel Braun, Visiting Professor Department of Government, Harvard University		

41st Parliament – Second Session	Date	Meeting
Organizations and Individuals		
Department of National Defence	2014/05/13	25
LGen Stuart Beare, Commander Canadian Joint Operations Command		
BGen G.D. Loos, Commander Joint Task Force (North)		
As individuals	2014/10/28	33
Andrea Charron, Associate Professor Deputy Director, Political Studies, Centre for Defence and Security Studies, University of Manitoba		
James Fergusson, Professor Director, Political Studies, Centre for Defence and Security Studies, University of Manitoba		
Canadian Defence and Foreign Affairs Institute	2014/10/30	34
Brian Bow, Fellow		
George Macdonald, Fellow		
Department of Fisheries and Oceans	2014/11/20	38
Nadia Bouffard, Deputy Commissioner Operations, Canadian Coast Guard		
Gregory Lick, Director Operations Support, Canadian Coast Guard		
SecDev Group		
Rafal Rohozinski, Principal		
As an individual	2014/11/27	40
Fraser Holman		
ING Robotic Aviation	2014/12/02	41
Ian Glenn, Chairman and Chief Executive Officer		
Zariba Security Corporation		
Charles Barlow, President		
As individuals	2014/12/04	42
Charles F. Doran, Andrew W. Mellon Professor International Relations, Nitze School of Advanced International Studies, Johns Hopkins University		
Christopher Sands, Senior Research Professor Director, Center for Canadian Studies, Nitze School of Advanced International Studies, Johns Hopkins University		
As individuals	2014/12/09	43
Robert Huebert, Associate Professor Department of Political Science, University of Calgary		
Whitney Lackenbauer, Professor Department of History, St. Jerome's University		

41st Parliament – Second Session	Date	Meeting
Organizations and Individuals		
Conference of Defence Associations Institute David Perry, Senior Analyst Security and Defence As an individual Ugurhan G. Berkok, Professor Department of Management and Economics, Royal Military College of Canada	2015/01/28	44
Royal Canadian Air Force Col Sylvain Y. Ménard, Commander 3 Wing Bagotville MGen D.L.R. Wheeler, Commander 1 Canadian Air Division	2015/02/16	46
Department of National Defence Col S.M. Moritsugu, Commander Canadian Forces Information Operations Group, CFS Alert BGen Kelly Woiden, Chief of Staff Army Reserve	2015/02/18	47
Department of National Defence MGen Christopher Coates, Deputy Commander (Continental) Canadian Joint Operations Command BGen G.D. Loos, Commander Joint Task Force (North)	2015/02/23	48
Department of National Defence RAdm John Newton, Commander Maritime Forces Atlantic and Joint Task Force Atlantic	2015/02/25	49
Department of National Defence LGen J.A.J. Parent, Deputy Commander North American Aerospace Defense Command (NORAD)	2015/03/09	50
Department of National Defence RAdm J.J. Bennett, Chief Reserves and Cadets BGen P.J. Bury, Director General Reserves and Cadets Col David W. Lowthian, Commander 8 Wing (Trenton)	2015/03/23	52
Department of National Defence Capt(N) S.A. Virgin, Deputy Commander Canadian Special Operations Forces Command	2015/03/25	53

APPENDIX B

LIST OF WITNESSES

41st Parliament – First Session Organizations and Individuals	Date	Meeting
Department of National Defence Riley D. Hennessey, Policy Analyst Directorate of Parliamentary Affairs Jill Sinclair, Assistant Deputy Minister Policy, Canadian Armed Forces	2013/03/18	71

APPENDIX C

LIST OF BRIEFS

Organizations and Individuals

Braun, Aurel

Doran, Charles

Government of Newfoundland and Labrador

Harvey, Frank

Sands, Christopher

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the Committee requests that the government table a comprehensive response to this Report.

A copy of the relevant *Minutes of Proceedings* ([Meetings Nos. 15, 16, 20, 21, 22, 23, 24, 25, 33, 34, 38, 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 52, 53, 55, 56, 57, 58, 61 and 62](#) from the 41st Parliament, Second Session and [Meeting No. 71](#) from the 41st Parliament, First Session) is tabled.

Respectfully submitted,

Hon. Peter Kent

Chair

