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TIME TO GO BALLISTIC

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Exercise Solo Flight

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TIME TO GO BALLISTIC

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The first ballistic missile fired in warfare was the German Vengeance Weapon 2, or V-2 rocket, used during World War II. Although not a sophisticated weapon, the Nazi forces used it as a weapon of terror, firing over 3,000 V-2 rockets against England, France, and Belgium. In London alone, over 2,500 people were killed by the weapon. By the end of the war, allied forces had captured, and reverse-engineered several V-2 rockets, and they became the blueprint for later ballistic missiles and anti-ballistic missile technology.

During the Cold War, the two superpowers (United States and Union of Soviet Socialist Republic) developed ballistic missile technology as a delivery vehicle for their respective arsenals of nuclear weapons. The first North American anti-ballistic missile system for North America was proposed by the United States in the early 1980's by the Reagan administration. The Strategic Defence Initiative (SDI, or Star Wars as it was affectionately called) was a space-based laser system which was designed to protect North America from ballistic missile attack. This was the first opportunity for Canada to get involved in ballistic missile defence. Criticized for its projected cost, moral questions about the weaponization of space, and its reliance on yet-to-be invented technology, Canada declined to participate in the program.

The second opportunity for Canada to get involved in ballistic missile defence occurred in 2005, when, as a result of increased proliferation, intelligence timelines predicted that "rogue states" could develop the capability of acquiring Intercontinental Ballistic Missiles (ICBM) within a foreseeable future. As a result, the North American

Aerospace Defense Command (NORAD) included ballistic missile tracking within its mandate. In addition, the United States proposed a ground-based ballistic missile defence system and once again invited Canada to participate. Again, Canada declined the offer to participate.

Now, with the threat of ICBMs possible within the next few years, the acceptance by NATO of ballistic missile defence as a NATO task, and the Canadian National Shipbuilding and Procurement Strategy (NSPS) about to build and acquire new warships, there is an ideal opportunity for Canada to participate in ballistic missile defence programs. Virtually all of the historical arguments against Canada's participation have been completely eliminated, and Canada should consider sea-based ballistic missile defence as a requirement of new, yet to be procured, air defence destroyers.

Ballistic missiles are missiles that are designed to deliver conventional, biological, nuclear, or chemical payloads over large distances. The missile is boosted only for the initial portion of its flight path, The projectile then glides along a flight path through either the outer atmosphere, or space, depending on the length of boost. This determines how far the missile will fly. During its midcourse phase, some ballistic missiles will deploy Multiple Independently-targetable Reentry Vehicles (MIRVs), along with decoys and/or radar countermeasures. The ballistic missile flight path presents difficulties for counter systems, as all MIRVs have to be countered once deployed, and speeds reached during the terminal phase can be extremely high. For these reasons, ballistic missile

defence is more costly, and technologically, much more difficult than offensive ballistic missile technology.¹

During the Cold War, American and Soviet planned delivery of nuclear arsenals shifted from that of bomber-based, to one of delivery by ballistic missile. In conjunction with ballistic missile technology, both sides pursued Ballistic Missile Defence (BMD). The accepted, and unproven, strategy to deter nuclear conflict between the two superpowers was a strategy of Mutual Assured Destruction (MAD), in existence since the 1950's. Overall, the strategy was relatively simple. Both sides had sufficient nuclear arsenals to completely annihilate each other. In the event of a nuclear conflict, neither side had an advantage, and any resort to all-out nuclear war would lead to eventual destruction of both. As an added measure to preserve the strategy of MAD, an agreement was agreed upon by the superpowers in 1972 regarding Anti-Ballistic Missile (ABM) systems. In accordance with the "Treaty on the Limitation of Anti-Ballistic Missile Systems the United States and the Soviet Union agree that each may have only two ABM deployment areas, so restricted and so located that they cannot provide a nationwide ABM defense or become the basis for developing one."² The aim of the treaty was to place qualitative and quantitative limits on ABM systems so as not to significantly reduce the threat of retaliation by the other's nuclear arsenal. The treaty remained in force until 2002, when the U.S. unilaterally withdrew.

¹ Daniel Rosenfield, *The Continued Need for National Missile Defence*, Vol. 9 (Toronto, Ont.: Canadian International Council Conseil international du Canada, 2011),1.

² Federation of American Scientists, "Anti-Ballistic Missile Treaty," <http://www.fas.org/nuke/control/abmt/> (accessed 04/15, 2014).

Programs to develop ABM systems began early in the Cold War. In the 1960's, the United States Army created the Safeguard Program. The basic premise of the system was based upon Spartan and Sprint missile interceptors that were armed with nuclear warheads and would intercept incoming ICBMs in the latter portions of a midcourse phase, or during the terminal phase. The use of nuclear-tipped warheads ensured that accuracy of the system did not have to be precise, and it would be able to destroy the ICBMs from several miles away, ensuring preservation of the retaliatory arsenal. Overall, the many weaknesses and primitive approach to this ABM defensive system was abandoned in search of more precise systems.³

In the early 1980's the Reagan administration explored several options for ABM systems. The first of these systems, entitled High Frontier, was based upon a network of several hundred satellites carrying rocket interceptors. When the system was proposed in November 1982 by retired General Daniel Graham, the Secretary of Defense Caspar Weinberger stated "although we appreciate your optimism that technicians will find the way, and quickly, we are unwilling to commit this nation to a course of action which calls for growing into a capability that does not currently exist."⁴ The second option explored was that of space-based lasers. In 1981 however, the Department of Defense's Science Board concluded "it is too soon to attempt to accelerate space-based laser development towards integrated space demonstration for any mission, particularly ballistic missile

³ Rosenfield, *The Continued Need for National Missile Defence*,1

⁴ Joseph Cirincione, "Brief History of Ballistic Missile Defense and Current Programs in the United States," *Carnegie Endowment for International Peace* (1 February 2000, 2000),3.
<http://carnegieendowment.org/2000/02/01/brief-history-of-ballistic-missile-defense-and-current-programs-in-united-states/4qy>.

defense.”⁵ Despite the apparent scientific hurdles to proposed ABM systems, on March 23, 1983, President Ronald Reagan challenged the scientific community to “turn their great talents now to the cause of mankind and world peace, to give us the means of rendering nuclear weapons impotent and obsolete.”⁶

President Reagan’s vision, the Strategic Defence Initiative, or Star Wars, was a system which included nuclear-powered X-ray lasers, hypervelocity rail guns and space-based kinetic intercept kill vehicles. Despite the existence of the ABM treaty, U.S. interpretation allowed for a system such as SDI as long as it was not based upon a ground-based intercept. The added advantage of a space-based system was that it could target ICBMs in their boost phase, where they are most vulnerable as a result of their slower speeds, and the infrared heat signature generated by exhaust plumes.

In addition to national audiences, President Reagan extended an invitation to other NATO countries to participate in the SDI program. In particular, Canada was extended the invitation, but opposition to the system grew quickly. In the early stages of the debate as to whether or not Canada should participate, then Prime Minister Brian Mulroney received over 5000 letters, of which only six supported Canadian participation.⁷ The reason for opposition was fourfold. First of all, it was widely believed that the existence of such a system would undermine the strategic balance of the MAD concept, as the U.S. could engage in nuclear attacks without the fear of retaliation. Secondly, since space does

⁵ *Ibid.*

⁶ *Ibid.*

⁷ Gordon Heath, "Ballistic Missile Defence: Good for Canada" (Masters of Defence Studies, Canadian Forces College), 6.

not belong to any nation, the weaponization of it poses morality issues. Thirdly, scientists speculated that based on current technology, the thousands of lines of code that would be required to control a space-based intercept was impossible.⁸ Finally, and most importantly, there was no apparent threat to Canada. At the time SDI was proposed, the only nations with ballistic missiles capable of threatening North America were the United States and the Soviet Union. Although the possibility of “rogue nations” acquiring ICBMs existed, the intelligence community assessed this was still decades away. It was widely believed that the cost of pursuing technology that scientists considered impossible to counter a threat, that if MAD remained a viable strategy, didn’t exist, was not fiscally responsible. Eventually, with the end of the Cold War, the SDI project was abandoned.

The second opportunity for Canada to join ABM defence came on February 16, 1996, when then President of the United States Bill Clinton’s Secretary of Defense, William Perry announced a National Missile Defense (NMD) Deployment Readiness Program. The program, often referred to as “3 plus 3” was designed as a robust, compressed, three-year research, development, test, and evaluation program (first 3), to be followed by a decision on whether or not to proceed to deployment. If a decision was made to deploy the system, made up only of ground-based interceptors, it would be in place three years later (second 3).⁹ By the end of August of that same year, the Joint Requirements Oversight Council (JROC) within the Joint Chiefs of Staff agreed to give Operational Command of the system to NORAD if Canada agreed or to U.S. Space

⁸ James G. Fergusson, *Canada and Ballistic Missile Defence, 1954-2009: Déjà Vu all Over Again* (Vancouver: UBC Press, 2010), 163.

⁹ *Ibid.*

Command if Canada's agreement was withheld. By the Spring of 1999, the United States put the National Missile Defense Act into law.¹⁰ On July 8, 2000, after a third failed test, President Clinton announced that current technology did not yet warrant deployment.

The cancellation of the NMD system gave Canada a brief reprieve in whether or not it should participate in ballistic missile defence. This reprieve was short-lived, however, as, on December 12, 2002, President George W. Bush announced that the United States would deploy a Ground-based Midcourse Defense (GMD) system at two sites, namely Vandenberg Air Force Base in California, and at Fort Greely Alaska.¹¹ "We plan to begin operating these initial capabilities in 2004 and 2005, and they will include ground-based interceptors, sea-based interceptors, additional Patriot (PAC-3) units, and sensors based on land, at sea, and in space."¹² Operational command of the system was assigned to the commander of US Northern Command, who is also dual-hatted as the commander of NORAD. In the fall of 2004, GMD became operational, with an initial deployment of two interceptors at Vandenberg Air Force Base, four interceptors at Fort Greely Alaska, and an X-band tracking radar stationed in Alaska. Additional interceptors would quickly be added. At the same time, the US began negotiations with Poland to install a third interceptor site in that country, and with the Czech Republic for installation of additional X-band tracking radars in that country. In August 2004, Canada and the U.S. agreed to assign the early warning component of GMD in North America to NORAD. Although this may have seemed like an acceptance by Canada of participation

¹⁰ *Ibid.*

¹¹ *Ibid.*

¹² Steven Staples, *Missile Defence: Round One* (Toronto: J. Lorimer, 2006), 12.

in ballistic missile defence, then Prime Minister Paul Martin surprised the U.S. by announcing in February 2005 that “Canada will not take part in the proposed ballistic missile defence system.”¹³

Prior to this decision to not participate in ballistic missile defence, Canada had been investigating the issue for several years. In the 1994 Defence White Paper seven conclusions were made. First of all, the White Paper advises that “a number of states have acquired, or are seeking to acquire, nuclear, chemical and biological weapons, as well as ballistic missile delivery capabilities.”¹⁴ In addition, “theatre missile programs cannot be discounted in planning for future contingencies”¹⁵ and that “Canada may want to retain the option of deploying forces to areas where they could face such weaponry.”¹⁶ In December 2003, in a report written at the University of British Columbia for the Liu Institute for Global Issues, the following conclusions were made. First of all “the technology to protect us from an ICBM-borne nuclear threat is not now available, and BMD technology is not ever likely to mature to the point of providing comprehensive protection from that peril.”¹⁷ Secondly, “even the pursuit of the severely limited and uncertain protection promised by Washington’s current BMD efforts is making us and the world less secure inasmuch as it exacerbates nuclear proliferation pressures, both horizontal and vertical.”¹⁸ Finally, that “mutually-beneficial security cooperation between

¹³ *Ibid.*

¹⁴ Department of National Defence, *1994 Defence White Paper* (Ottawa Ont: DND Canada,[1994]).

¹⁵ *Ibid.*

¹⁶ *Ibid.*

¹⁷ Ernie Regehr, *Canada and Ballistic Missile Defence* (Waterloo Ontario: Project Ploughshares,[2003]).

¹⁸ *Ibid.*

Canada and the United States neither depends on, nor is advanced by, the Canadian embrace of BMD.”¹⁹

In addition to the official opposition by formal report, several other groups voiced opposition of any involvement in BMD by Canada. For example, in March 2005, in an article entitled *Let's Not Go Ballistic*, the Canadian Centre for Policy Alternatives discusses several reasons Canada should not participate. First, it has been argued that in order to have the ability to make decisions regarding BMD in North America, Canada must be an active participant. The Canadian Centre for Policy Alternatives refutes this claim, stating that “what Canada can expect to get from participation is a seat on the missile defence bus and a ticket to ride wherever the program is going. What we will not get is a role in the driver’s seat.”²⁰ Secondly, the article refutes any claim that there is any actual threat from rogue states, and that if it can be assumed that an actual threat exists, or will exist, any defensive system will be incapable of defending North America from the threat. The third argument against BMD proposed is that of the overall effect on Canadian security. The article claims that by building up an ABM system, Russia and China will not only increase the numbers of missiles it has, but will continue research ways to defeat the defensive systems.²¹

In addition to the opposition arguments above, the Canadian Centre for Policy Alternatives also proposes two other arguments against Canadian participation in BMD.

¹⁹ *Ibid.*

²⁰ Bill Robinson, *Let's Not Go Ballistic* (Ottawa, Ontario: Canadian Centre for Policy Alternatives, 2005),7.

²¹ *Ibid.*

The first of these arguments is an echo of one that was presented during the debate on Canada's participation in the SDI. One of the key arguments against participation, echoed recently, is the issue of the weaponization of space. The article *Let's Not Go Ballistic* quotes Canada's long-standing opposition to the placement of weapons in space as enunciated in a speech by then Prime Minister Paul Martin in which he directed "we will not, in any way support the weaponization of space."²² Finally, the last, and probably most important and widely-supported argument against Canadian participation in BMD is that of cost. According to this argument, the actual cost of BMD participation is exorbitant and that Canada should not participate in an unproven system with a risk of having to divert funding from Canada's essential social programs."²³

In order to convincingly show that the time has come for Canada to participate in BMD, the historical occasions in which Canada has had the opportunity, but declined, and the reasons for its' decision are intrinsically important. Even more important, however, is the requirement to show that the reasons Canada has not participated previously are not, or at least, significantly less, valid.

The first premise posed by opponents to Canada's participation is that Canada should not be a party in any BMD program in which it would not have a significant role to play in its employment. In particular, the GMD program is singled out as a program in which, since it was designed by, and its use would be, for the most part, controlled by the United States, any participation by Canada is inconsequential. The discussions involving

²² *Ibid.*

²³ *Ibid.*

NORAD accepting the role of BMD illustrate the inherent weaknesses of not participating in a BMD program designed for the defence of North America.

Shortly after the announcement by President Bush that the U.S. would pursue a GMD system for the defence of North America, and the fact that operational command would be given to the commander of Northern Command (also the commander of NORAD), the Canadian government recognized that, at the very least, the responsibility of ballistic missile tracking would need to become the responsibility of NORAD. In January 2004, one year before Prime Minister Paul Martin's emphatic statement that Canada would not participate, the incumbent Minister of National Defence, David Pratt requested from U.S. Secretary of Defence Rumsfeld "to negotiate in the coming months a Missile Defence Framework Memorandum of Understanding (MOU) with the United States with the objective of including Canada as a participant in the current US missile defence program."²⁴ The premise was to use NORAD as the centrepiece for Canadian participation, and, the United States agreed to consult with Canada on operational planning areas.

Eight months later, before the Prime Minister's announcement, when the amendment to NORAD's roles and responsibilities was announced, it reflected a change in NORAD's roles and responsibilities to include ballistic missile tracking. At that time, the Canadian government separated the NORAD decision from the decision to participate in GMD. The reason for this separation of decisions was that there was concern that if

²⁴ James Fergusson, "Shall we Dance? the Missile Defence Decision, NORAD Renewal, and the Future of Canada-US Defence Relations," *Canadian Military Journal* 6, no. 2 (Summer 2005, 2005), 14.

acceptance of NORAD's role of ballistic missile tracking was not accepted by Canada, the future of NORAD might be in jeopardy. The Canadian government was explicit that in agreeing that NORAD would be responsible for tracking ballistic missiles did not necessarily mean that Canada would participate in BMD. The decision for Canada not to participate in BMD leaves an interesting situation with respect to defence of North America. Currently, Canada employs more than 100 military personnel in NORAD. If a conventional bomber attack was to threaten North America, Canadian officers would fully participate in the response. If however, the attack was one of ballistic missiles, Canadian officers would be excluded.²⁵ Canada, essentially, would have no say in when/where the ballistic missiles would be intercepted and there would be little concern for the damage caused by debris if intercepted in Canadian airspace. By becoming a participant in GMD, Canada would not only be a full participant in BMD planning, but additional interceptors could be added in Canada. Since Canada is on a large number of ICBM trajectory lines between countries currently with ICBMS, some who are in the process of acquiring ICBMs, and the United States, these interceptors would reduce the likelihood of intercepts over Canadian territory, or at least, could assist in planning to reduce possible damage of intercepts over Canadian population centres²⁶. It is obvious then, that in order to have any say in the defence of North America from ballistic missiles, Canada should be an active participant in BMD.

²⁵ Colin Kenny, "The Case for Missile Defence," *National Post* Sep 16, 2013, 2013.

²⁶ Matt Gurney, "It's Time for Canada to Openly Embrace America's Missile Defence," *The National Post* 2013.

The second cause of historical opposition to Canada's participation in BMD has been the lack of a clearly defined threat. Even as late as 2005, when Prime Minister Martin reaffirmed Canada's unwillingness to participate in BMD, the threat to Canada, and Canadians, from ballistic missiles, was minimal. This situation has changed significantly. In an article entitled *Transatlantic Teamwork: Enhancing the NATO Ballistic Missile Defence Capability*, the Programme Manager for Ballistic Missile Defence estimates that, in 2014, over 30 countries have, or are acquiring, ballistic missile technology.²⁷ In its 2013 report on ballistic and cruise missile threats, the United States National Air and Space Intelligence Center states that, along with Russia and China, ICBM technology is being pursued by North Korea, Iran and India. Although North Korean test launches of their ICBM platform in 2006, 2009, and 2012 ended in failure, a December 2012 launch of a satellite into orbit demonstrates the determination of North Korea to achieve long-range ballistic missile and space launch capabilities. In the same report, it makes an assessment that Iran could develop and test an ICBM capable of reaching North America by 2015. For India, although the ICBM program is in its infancy, the first flight test of its first ICBM platform was conducted in April 2012, and a second, even longer platform, is reportedly in the design phase.²⁸ Although it may be unlikely that Russia, China, or even India will use their ICBM arsenal on North America, the pursuit of this technology by "rogue states" such as Iran and North Korea is now a very real possibility, and exportation to even more countries becomes a near certainty.

²⁷ William Veldhoven, "Transatlantic Teamwork: Enhancing the NATO Ballistic Missile Defence Capability," <http://www.act.nato.int/article-2014-1-15> (accessed 04/20, 2014).

²⁸ National Air and Space Intelligence Center, *Ballistic & Cruise Missile Threat* (Wright-Patterson Air Force Base, Ohio: National Air and Space Intelligence Center, [2013]).

In addition to the threat from ICBMs, the threat to Canadians from Theatre Ballistic Missiles (TBM) is even more likely. After the invasion of Kuwait in January 1991, Saddam Hussein showed no reluctance to using his indigenously modified medium range SCUD short-range ballistic missiles (SRBMs) acquired from the Soviet Union. The major threat from these weapons was the possibility that he would equip the missiles with chemical or biological weapons. Although, overall the technology in the SCUD is assessed as archaic by today's standards, the assessment is that countries could acquire, and modify the system to significantly improve their accuracy and use them against high value military targets and cities. In addition to Russian and Chinese vast arsenals of SRBMs, five other countries including North Korea, Iran and Syria are known to have in their possession at least 10 different variants of SRBMs. India and Pakistan also have SRBM arsenals of at least four variants of SRBM each.²⁹ The same countries that possess SRBMs have also acquired medium-range and intermediate-range ballistic missiles (MR/IRBMs). In addition, Saudi Arabia can be added to the list of countries possessing MR/IRBMs. In total, six countries possess this type of missile with 16 different known variants in total.³⁰

Even though the threat from SRBMs and MR/IRBMs is not to Canadians within the confines of North America, expeditionary forces from the Canadian Armed Forces will increasingly face a threat from these systems. Modern conflicts in Iraq and Afghanistan have shown that conflicts in less-than-stable countries are increasingly likely. The Canadian government's *Canada First Defence Strategy* recognized that "the

²⁹ *Ibid.*

³⁰ *Ibid.*

proliferation of advanced weapons and the potential emergence of new, nuclear-capable adversarial states headed by unpredictable regimes are particularly worrisome.³¹ Within the document, the government has identified 6 key tasks of the Canadian Armed Forces. Of these tasks, the government has included to “lead and/or conduct a major international operation for an extended period.”³² Unfortunately, in order to remain credible, Canada does not have the option of deciding which areas of the world it can, and which areas of the world it cannot operate. It is very possible, and indeed likely, that in the next conflict in which Canada participates, TBMs will be a viable threat. Later, in the defence strategy, the government commits to “making sure that Canada has the tools it needs to deal with the full range of threats and challenges to Canada and Canadians.”³³ The combination of an ICBM threat to North America, coupled with the proliferation of TBM systems mean that Canada, and Canadians are more likely to face a threat from ballistic missiles in the very near future. It is the advancement of these threats that make it necessary for Canada to begin participation in ABM programs.

The third point historically raised for Canadian non participation in ballistic missile defence has been that participation in ABM systems upsets the balance of Canadian and global security. The premise of the argument is that, if countries like Canada acquire ABM technology, other countries will be inclined to pursue the development of increased numbers of ballistic missiles. Canada was never a signatory to the ABM treaty, and as stated earlier, the U.S. withdrew from the treaty in 2002. The

³¹ Department of National Defence, *Canada First Defence Strategy* (Ottawa, Ontario, Canada: Department of National Defence,[2008]).

³² *Ibid.*

³³ *Ibid.*

proliferation of ICBM and TBM systems by other states other than Russia has not been slowed by the existence of treaties, and although following the spirit of the treaty was necessary for the strategy of MAD, other countries not a party to the Strategic Arms Reduction Treaty (START II) have continued to develop ballistic missiles. In order to defend Canada and Canadians from ballistic missiles, Canada should begin participation in ABM programs.

The next argument used against Canadian participation in ABM programs has been the moral question of the weaponization of space. This point is the most irrelevant used to counter participation/acquisition of today's ABM systems. The systems that are proposed are all ground-based, and the fact that the U.S. is showing "benign neglect" of NASA shows there is little interest of weaponizing space.³⁴

The most critical historical argument against Canadian participation, and will continue to be an important factor, is affordability. Canada has always considered itself as a middle power on the world stage. Practically, this means that although some capability is required in all warfare domains, the most "high tech" option may not always be required. The announcement of the Canadian government's National Shipbuilding Procurement Strategy in 2010, with the replacement of existing frigates with a modern Canadian Surface Combatant provides an opportunity to build warships capable of sea-based BMD for a limited incremental cost increase over non-BMD capable platforms.

³⁴ Gurney, *It's Time for Canada to Openly Embrace America's Missile Defence*

Sea-based BMD has already been proven as a viable concept. NATO established BMD as an accepted concept in September 2005 with an Active Theatre Ballistic Missile Programme, initially in recognition of a need to protect deployed forces from TBMs.³⁵ By 2010, the threat to Europe from ICBMs launched from “rogue states” had increased to such a point that NATO has fully recognized BMD as a NATO task. In support of this mission, a program entitled the European Phased Adaptive Approach (EPAA) was welcomed by NATO. Key components of this program have been, the willingness of Poland to host a BMD radar at Kurecik, Romanian and U.S. agreement to place Raytheon Standard Missile 3 (SM-3) interceptors at Deveselu airbase, and the upgrading of four Netherlands frigates with extended long-range BMD early warning capability. For the foreseeable future, the stationing of U.S. BMD-capable Arleigh Burke destroyers in the Mediterranean Sea in Rota, Spain will be the most critical components of this European BMD strategy.³⁶

One of the most long-standing critiques of BMD as a whole has been the viability of destroying one missile with another. After the Iraqi use of SCUD missiles in the first Gulf War, the United States deployed the newly completed Patriot Missile System. Popular media had shown pictures of Patriot missile intercepts, but further analysis subsequently showed the success rate considerably less than first believed. Subsequent tests proved that the idea of using a missile to shoot down another missile is extremely difficult and likelihood of success has historically been very limited. Technology has,

³⁵ Veldhoven, *Transatlantic Teamwork: Enhancing the NATO Ballistic Missile Defence Capability*

³⁶ NATO, "Missile Defence NATO," <http://www.nato.int/docu/review/topics/en/Missile-defence.htm> (accessed 04/20, 2014).

however, matured to a point that realistic BMD testing has shown the concept as viable. The U.S. Department of Defence claims that, since 2002, “the Aegis BMD system has achieved 25 successful exo-atmospheric intercepts in 31 attempts using the SM-3 missile, and 3 successful endo-atmospheric intercepts in 3 attempts using the SM-2 Block IV missile.”³⁷ In addition, on February 20, 2008, a BMD-capable Aegis cruiser operating North of Hawaii used a modified version of the Aegis BMD system to shoot down an interoperable US surveillance satellite that was in a deteriorating orbit.³⁸

The acquisition of a sea-based BMD capability is becoming an increasing necessity for expeditionary operations. As previously shown, the proliferation of TBMs has increased significantly, and a sea-based BMD capability could be used to assist in defence of allied troops ashore. In addition to TBM defence for land-based assets, both China and Iran have openly been developing an Anti-Access capability. Within this capability Anti-Ship Ballistic Missiles have become a major component. The need for capability against this threat, and that of TBMs can be seen in the Royal Canadian Naval Publication entitled *Securing Canada's Ocean Frontiers Charting The Course from Leadmark*. Within this publication, the RCN has identified one of the key naval strategy elements for 2025 as “expand the fleet capability required for joint expeditionary operations with special regard for the future security environment, capable of conducting Sea Control and projecting power ashore in the support of the joint battle.”³⁹ Although

³⁷ Ronald O'Rourke, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress* Congressional Research Service,[2014]).

³⁸ *Ibid.*

³⁹ Directorate of Maritime Strategy, *Securing Canada's Ocean Frontiers Charting the Course from Leadmark* (Ottawa, Ontario, Canada: Department of National Defence,[2005]).

reference is not made to BMD explicitly, it is apparent that to achieve the strategy, BMD must be considered. As the U.S. has shown in its plan for BMD defence of Europe, not only can sea-based BMD be used for unit self defence and TBM defence, if stationed appropriately, sea-based BMD can be the cornerstone of national defence from ICBMs.

In addition to the ability to defeat a ballistic missile threat, the acquisition of systems capable of BMD will not only increase the RCN's ability to be interoperable with allied navies, it will also increase its ability to defend against some of the most sophisticated anti-ship cruise missiles (ASM). Highly capable sea-skimming ASMs are being widely proliferated. For example, the SSN-27 Sizzler is an ASM that flies a subsonic sea-skimming profile until it is approximately 12 nautical miles from the target, then launches a supersonic sprint vehicle at speeds in excess of mach 2.9. It is evident that the optimal manner in which to defeat this threat is to engage the missile before it launches its sprint vehicle. Laws of physics, namely curvature of the earth, mean that detection by the target vessel outside of this range proves very difficult. In recognition of this limitation, and to assist in defeat of threats like the Sizzler, the United States is developing a system called CEC or Cooperative Engagement Capability. The design of this system is such that if another vessel or sensor in company with the target vessel is able to detect an incoming threat, it could pass the information to the target vessel with enough accuracy for the target vessel to defend itself before it detects the threat organically, this capability is called Engage on Remote, which is an ideal capability for BMD. As a result of distances at which ballistic missiles must be detected, and the speed at which they travel, the sensor is very rarely the same platform that will engage the

threat. By pursuing BMD capability, the RCN will, as an added benefit, be able to be interoperable within a CEC network and will have greater capacity against more technologically advanced ASMs. The interoperability with other nations is also a natural extension of any pursuit of BMD. Countries that have been identified as potential BMD operators include the United Kingdom, the Netherlands, Spain, Denmark, Germany, South Korea and Australia. The leading BMD system is identified as the US Aegis system, which, along with the U.S. and Japan, is being acquired by Spain, South Korea, and Australia.⁴⁰

The requirement for, and benefit of, acquiring a BMD capability are incontrovertible. The next issue is whether or not it is affordable for Canada. As stated previously, Canada can acquire this capability for an incremental increase above what is already being proposed in the NSPS. Canada already utilizes the Mk 41 Vertical Launcher with the SM-2 missile. The new Canadian Surface Combatant could utilize the same launcher, with the same SM-2 missile for air defence. By procuring an Aegis 4.0.1 system, the RCN would be capable of utilizing newly developed SM-6 active air defence missiles as well as the SM-3 ABM. Aegis BMD ships are inherently flexible both in their possible deployment patterns and their use of the MK 41 VLS which allows for an assortment of missile types within the cells.⁴¹ Even if the Raytheon SM-3 missile proves to be prohibitively costly, the benefits of being able to use the missile may prove to be extremely useful, as it is in both Canada, and the U.S.' best interest to maximize

⁴⁰ Ronald O'Rourke, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress*, 13

⁴¹ David McDonough, *Back to the Future: Debating Missile Defence in Canada...Again* (Calgary, Alberta Canada: Canadian Defence & Foreign Affairs Institute,[2013]).

deployments of BMD capable ships if North America ever came under a stated threat of ICBMs.

Canada has historically had multiple opportunities to join the United States in Ballistic Missile Defence. Both the Strategic Defence Initiative and National Missile Defence Program proved to be ahead of both the requirements for them and overall, technologically not possible at the time. The introduction of the U.S. GBD system came at a time when the threat was more acceptable, and technologically possible. Canada, however, for very valid reasons, declined to participate in any of these programs. With the NSPS however, Canada has an opportunity to acquire BMD capability efficiently, and with little incremental cost to the RCN. The many historical arguments against Canadian participation in BMD, though very valid at the time the participation was offered, are considerably less, or even completely invalid. The acquisition of sea-based BMD will not only allow Canada to participate in the defence of North America from ICBMs, but will enhance Canada's ability to defend allied expeditionary forces abroad from TBMs. An added benefit of BMD capable systems will make Canadian naval systems more operable with allied navies, and will naturally give Canadian ships added capability against modern ASMs like the SSN 27 Sizzler. Now is the time for Canada to go ballistic.

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