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EMPOWERING SUSTAINMENT: THE EVOLUTION OF LOGISTIC SUPPORT IN A PAN-DOMAIN BATTLESPACE

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Solo Flight

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IN A PAN-DOMAIN BATTLESPACE**

By Lieutenant-Colonel Christina Marentette

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I know not with what weapons World War III will be fought, but World War IV will be fought with sticks and stones.

— Albert Einstein

INTRODUCTION

The Canadian Armed Forces (CAF) is currently planning for a fundamental transformation in the way the government and military planners view operations. The future battlefield for democratic militaries is more uncertain and complex than ever before, and this trend is expected to continue for the foreseeable future. Past battles and conflicts up to and including Afghanistan and Iraq have followed the traditional doctrine of winning the Air, Land, or Sea battlespace and how to operate in those domains. However, today's sophisticated and inexpensive technology is readily available to any government, military, terrorist group, formed resistance movements, or single rogue actor. These new technologies incorporate and require the use of space-based networks, cyber networks, and information networks which can all be used as weapons for military use, and unfortunately are also highly vulnerable to attack or disruption. This new age of military science has been called the multi-domain battlespace or pan-domain battlespace. Numerous militaries and governments are recognizing that the future fight is changing dramatically and soon. In Canada, the Chief of Defence Staff (CDS) has coined this term as Pan-Domain battlespace and has drafted a new framework for the CAF to initiate major changes in the way Canada plans and operates in the future battlespace. The Pan-Domain Force Employment Concept (PFEC) is meant to enable the CAF to compete with, contest with,

confront, and combat our nation's adversaries while evolving to a more joint force that will integrate across domains physically, organizationally, and cognitively.¹

While this pan-domain concept is still being shaped before formal distribution, as a Logistics Officer in the CAF, one cannot help but wonder how the CAF will sustain forces across the three new domains of space, cyber, and information when the CAF struggles to sustain the traditional domains with little precision or robustness. The draft PFEC document speaks predominately to planning and operations and gives very little detail about sustainment which is understandable in this pre-conception period.² It is certainly agreed amongst like-minded nations that the multi-domain space will be the future of fighting operations and thus the CAF is evolving to meet this challenge. Sustainment activities and operations must prepare for the challenges of supporting combat forces in a pan-domain environment that used to be relatively dominant and successful in traditional domains with physical force protection alone. The future of logistics must now operate and protect sustainment in the virtual realms of cyber, space, and information. Logistics networks will undoubtedly be vulnerable to attack and seen as high value targets that can easily be disabled, destroyed, or spoofed by adversary cyber and space effects from outside a traditional Operations Area (OA).³ Additionally, the enemy could use the information domain to target Canadian civilian contractors and suppliers that provide daily inputs into the CAF Supply Chain to achieve desired erosion of capabilities, capacities, or trust. This new era of combat must be met with new logistics doctrine, innovative ideas and methods, and a new pan-domain mindset for future logistics personnel. This paper will demonstrate that

¹ Chief of Defence Staff, "DRAFT//Pan-Domain Force Employment Concept: Prevailing in an Uncertain World" (National Defence, 2019). 2.

² Chief of Defence Staff. 43.

³ Matthew Miller, "Multi-Domain Intelligence Support for Sustainment," *Army Sustainment* 51, no. 3 (2019): 42–43.

CAF logistics in the pan-domain will require major transformational shifts in the Logistics Branch structure, training, and employment. First, the changes to partner nation's combat theory with respect to the pan-domain environment and how they will sustain the multi-domain battlespace will be discussed. Secondly, an analysis will be provided regarding whether the CAF logistics enterprise is suitable for future pan-domain conflicts by exploring the logistics structure, training, and employment concept.

THE FUTURE BATTLESPACE

To understand the emerging pan-domain, one must first understand the operating environment that militaries are leaving behind to endorse this new call to preparedness across domains. The World Wars were fought through the three traditional domains of warfare: air, land, sea. These domains dictated how nations built their military defences. Countries have long invested in air forces, army soldiers and equipment, and navy ships. The first US-Iraq Gulf War in 1991, will likely be the last large scale conventional war that we are likely to see in our lifetime. Pounding airstrikes, armored tank invasions, and ship to surface missiles all contributed to a massive showcase of conventional power before Iraq withdrew from Kuwait. After this absolute decisive and rapid battle, nations around the globe surely realized that future combat with the US and coalition partners could not be contested with conventional war tactics or machinery.⁴ Subsequently, the war in Afghanistan starting in 2001 and the 2003 Iraq War introduced a new style of warfare that required new doctrine with aims to achieve the support of local population to validate the host nation government.⁵ For now, Counterinsurgency

⁴ "Joint Chiefs of Staff, Doctrine: Joint Concepts," accessed April 27, 2020, <https://www.jcs.mil/Doctrine/Joint-Concepts/JOE/>. 33.

⁵ Bureau of Political-Military Affairs: <http://www.state.gov/t/pm> U. S. Department of State, "U.S. Government Counterinsurgency Guide," December 31, 2008, <https://www.hsdl.org/?abstract&did=.> 2.

Operations (COIN) have been the method of countering terrorist uprisings. Numerous military strategists believe the era of COIN is ending and a new type of warfare will emerge.⁶ The future of conflict will come from unconventional, non-military, and non-state actors who can challenge an opponent without the support of their government and can do so without aircraft, tanks, or ships.

The CDS has paraphrased the military threat of the 21st century as, “the existing international rules-based system that will be increasingly challenged by new forms of major power competition and by the diffusion of power through new structures, by new actors, creating a rise in global uncertainty.”⁷ The CAF has chosen the term *pan-domain* to describe this new challenge to traditional war operations. The Australian Defence Forces (ADF) have called it *Accelerated Warfare*, and they are preparing to be *Future Ready*.⁸ The US Army has chosen to call it the *Multi- Domain Battle*.⁹ The main message from these forces is that the future operational environment has changed. Military experts agree that these domains will not be dominated by any one state and nations can no longer assure absolute freedom of movement when considering the threat from all six domains. Near-peer competitors will have similar or superior weaponry to the Five Eyes (FVEY) community, with the proliferation of cheap technology that can penetrate across the globe.¹⁰ Adversaries have expanded the battlefield with competitive weapons that are less bound by geographic and time constraints.¹¹ Additionally, the

⁶ “Marine Corps Operating Concept,” accessed April 23, 2020, <https://www.mccdc.marines.mil/MOC/>. 8.

⁷ Canadian Armed Forces, “Beyond the Horizon: A Strategy for Canada’s Special Operations Forces in an Evolving Security Environment” (National Defence, January 2020). 4.

⁸ Australian Army, “Accelerated Warfare,” Text (Australian Army, August 8, 2018), <https://www.army.gov.au/our-work/from-the-chief-of-army/accelerated-warfare>. 1.

⁹ “TRADOC Pamphlets - Administrative Publications, United States Army Training and Doctrine Command (TRADOC),” accessed April 20, 2020, <https://adminpubs.tradoc.army.mil/pamphlets.html>. i.

¹⁰ Chief of Defence Staff, “DRAFT//Pan-Domain Force Employment Concept: Prevailing in an Uncertain World.” 34.

¹¹ Chief of Defence Staff. 11.

FVEY reliance on US overmatch across the traditional three domains is no longer a safe assumption. “The proliferation of precision-guided weapons, integrated air defenses, cyberspace weapons, counter-space weapons, and other technologies allows an increasing number of potential adversaries to contest and hold at risk U.S. forces in all domains.”¹² For all FVEY nations forces, the cyber and electromagnetic spectrum, space, and information domains are considered top priorities for training and operations for future combat.¹³ The enemy has already begun operating in the pan-domain; they are employing cyber-attacks, electronic warfare, and media disinformation crusades.¹⁴ This targeting by enemy threats has, and is, occurring below the threshold of armed conflict.

Preparing for the Future Fight

The challenges posed by rivals in their ability to generate political and military stand-offs, demands that forces must apply joint capabilities systematically (earlier, in greater capacity, and at lower echelons) and in new ways (faster and with greater agility).¹⁵ This “jointness” will have to occur at all levels from tactical to operational to strategic and also cross over into joint multinational forces. However, Canada is not alone, the US military with all its might, has also recognized that the multi-domain battlespace will require extensive multinational readiness and convergence of mission goals.¹⁶ The CDS has stated we must ensure, “our forces are organized,

¹² “TRADOC Pamphlets - Administrative Publications, United States Army Training and Doctrine Command (TRADOC).” A-1.

¹³ Chief of Defence Staff, “DRAFT//Pan-Domain Force Employment Concept: Prevailing in an Uncertain World.” 3.

¹⁴ Canadian Armed Forces, “Beyond the Horizon: A Strategy for Canada’s Special Operations Forces in an Evolving Security Environment.” 4.

¹⁵ “TRADOC Pamphlets - Administrative Publications, United States Army Training and Doctrine Command (TRADOC).” ix.

¹⁶ Curtis A. Buzzard and Steven M. Dowgielewicz Jr, “Multinational Sustainment Is Essential to the Next Fight: The Multi-Domain Battle Environment Requires the Army to Operate as Part of Joint, Multinational Force down to the Tactical Level. This Force Will Require Integrated Multinational Sustainment of Forces,” *Army Sustainment* 50, no. 3 (2018): 46.

manned, trained, and equipped for seamless operations across all domains, both internally to the CAF and to extend any complimentary reinforcing advantage to our allies.”¹⁷ The imperative core missions from *Strong, Secure, Engaged* (SSE) certainly speak to the same expected increase in combined joint operations across the pan-domain with North American Aerospace Defence (NORAD), North Atlantic Treaty Organization (NATO), FVEY partners.¹⁸

While the literature on pan-domain operations is limited, it is evolving quickly, and is currently dominated by the US military. The US, Canadian, and Australian forces have initial doctrinal documents to guide army, air, navy, and marine operations from a truly operational view while only considering the essential mission tasks conducted by front line operators.¹⁹ Many changes to future employment concepts of the traditional three domains are recognized to require modernization including the addition of cyber, space and information. Furthermore, tactics, organizational structure, capabilities, training, and people are identified for significant changes. US Army documents suggest that to effectively compete against a near-peer adversary, forces will have to operate within the scope of an adversary’s long-range anti-access and area denial (A2/AD) systems.²⁰ Therefore, movement, maneuver, concealment, and dispersion must be effectively employed by forward echelons. Previously, US Army forces could locate deep within a country with huge main operating bases and forward operating bases with relatively

¹⁷ Chief of Defence Staff, “DRAFT//Pan-Domain Force Employment Concept: Prevailing in an Uncertain World.”²⁰

¹⁸ National Defence, “Strong, Secure, Engaged: Canada’s Defence Policy,” policies, aem, September 22, 2017, 14.

¹⁹ Canada has the PFEC and CANSOFCOM Beyond Horizons: *A Strategy for Canada’s Special Operations Forces in an Evolving Security Environment* documents, US Army has created the TRADOC Pamphlets for Operations and Sustainment in Multi-domain, US Marine Corps has The Marine Corps Operating Concept: *How an Expeditionary Force Operates in the 21st Century*, US Joint Chiefs of Staff has Joint Operating Environment 2035: *The Joint Force in a Contested and Disordered World*, and ADF has the Accelerated Warfare Futures: *Statement for an Army in Motion*.

²⁰ “TRADOC Pamphlets - Administrative Publications, United States Army Training and Doctrine Command (TRADOC).” F-2.

easy freedom of movement and secure camp infrastructure. This will no longer be the case for any force operating in the pan-domain within the reach of cyber, space, and information effects. The US Army is restructuring their forces to a “Calibrated force posture” which is the combination of capacity, capability, position, and the ability to maneuver across strategic distances.²¹ The US Army will plan for large scale combat operations with a focus on converging semiautonomous brigade combat teams when required.²² The A2/AD capabilities of adversaries requires changes to previously predictable command and control structures and support systems. “Military forces will mass to concentrate combat power against the enemy. However, this massing will also make them vulnerable to the effects of enemy fires, and they will find it necessary to disperse.”²³ Thus decentralized control will be required to make independent mission decisions.

When it comes to training for the multi-domain battlespace, the US Army has stated,

“Enabling commanders and staffs at each echelon to visualize and command a battle in all domains, the EMS, and the information environment, converging organic and external capabilities at decisive spaces. This requires new tools to more rapidly converge capabilities across the Joint Force, shifting training paradigms, and changing personnel and talent management practices. This also requires that Army formations be trained, manned, and equipped to leverage all available information, from national, joint, commercial, and Service repositories and libraries, or directly from collection assets seamlessly and in a time dominant manner.”

This is likely certain for all FVEY countries and their future training of forces.

Additionally, the power of Artificial Intelligence (AI) is also intertwined with speak of the multi-domain. Militaries are recognizing that AI can provide operational and training gains. The PFEC alludes to changes in business, at all levels of organization – from

²¹ “TRADOC Pamphlets - Administrative Publications, United States Army Training and Doctrine Command (TRADOC).” 17.

²² Paul C Hurley Jr, Tracie M. Henry-Neill, and Rebecca S. Brashears, “Sustainment Innovation for Multi-Domain Battle,” *Army Sustainment* 50, no. 1 (2018): 5.

²³ “Marine Corps Operating Concept.” 15.

tactical to strategic – and across all functions, including intelligence, logistics, health services, operations, administration, and training.²⁴ Training must adapt immediately to remain relevant in the pan-domain to ensure joint effects are understood across six domains. The final significant change is the way militaries understand and employ people to maximize human efficiency in the pan-domain. The ADF has stated that they must, “capitalize on human potential – to give people a voice, empower their ideas and foster a culture where learning, experimentation, innovation and adaption are the norm.”²⁵ Similarly, the US Army believes in building trusted teams of professionals that thrive in ambiguity and chaos and who are empowered through a doctrine of mission command to rapidly react to threats and opportunities based on a commander's intent.²⁶ In summary, the pan-domain battlespace requires significant upgrades to tactics, organizational structure, training, and employment of people in order to fully exploit and control the future combat environment.

US Sustainment in the Multi-Domain

The US military is significantly ahead of their allied peers when conceptualizing sustainment support to their combat forces within the multi-domain battlespace. The US has produced numerous academic journal articles and have updated key doctrinal manuals such as Field Manual (FM) 3-0, *Operations* and FM 4-0, *Sustainment Operations* to include preparing to sustain in the multi-domain.²⁷ The US Army and

²⁴ Chief of Defence Staff, “DRAFT//Pan-Domain Force Employment Concept: Prevailing in an Uncertain World.” 23.

²⁵ Australian Army, “Accelerated Warfare.” Army in Motion. 2.

²⁶ “TRADOC Pamphlets - Administrative Publications, United States Army Training and Doctrine Command (TRADOC).” F-3.

²⁷ Lt Gen Michael D Lundy et al., “Field Manual 4-0: Driving Sustainment Change,” *Military Review* 100, no. 1 (2020): 7.

Marine Corps have identified key sustainment areas that require essential change in order to be future ready such as new tactics, technologically advanced tools, modernized training and enhanced employment of sustainment personnel.

The US vision of multi-domain sustainment makes significant changes to tactics. The urgent threat for sustainment in the multi-domain will be the risk of adversary A2/AD capabilities; sustainment nodes and mass stock pileups will be high value targets. To reduce this threat, sustainers will have to become re-familiarized with traditional dispersion, maneuver, and camouflage tactics equivalent to their army combat arms peers. The US has realized the days of stockpiling equipment at static Forward Operating Bases (FOBs) poses too much of a threat in the multi-domain. Tactics must change to keep logistics mobile, dispersed, and interoperable with partner nations, and managed by enterprise resource planning.²⁸ An example of new tactics are a unit's lines of distribution are inversely proportional to its operational reach. The US Army is increasing the load of Days of Supply (DOS) that a tactical unit would independently hold; historically, each unit would hold three DOS, now to succeed in the multi-domain they are planning for seven DOS.²⁹ This greater burden on the combat tactical unit allows autonomous maneuvers for longer durations without a sustainment tail. These are just a few tactical changes to the sustainment chain that will fundamentally change the way logistics is delivered compared to past conflicts.

Future logistics will require technological change to achieve efficiencies in footprints and resource consumption. The US military has stated that future sustainment

²⁸ Paul C Hurley Jr, Henry-Neill, and Brashears. 6.

²⁹ Peter Van Howe, "The Challenges of Multi-Domain Sustainment," *Army Sustainment* 51, no. 2 (2019): 51.

will be driven by additive manufacturing (3D printing), unmanned delivery platforms, increased collaboration across software systems, and the proliferation of Artificial Intelligence (AI) to manipulate big data and to sense and respond to decision making.³⁰ However, the US is also cognizant that they must blend new technology with old weapons platforms and tactics. They are calling this “*Hybrid Logistics*”, where they still envision operating heavy, complex and sustainment-intensive platforms but are seeking technological advances to reduce their footprint.³¹ Additionally, the US is procuring technologically advanced life support systems that reduce logistical footprints and reduce the need to be positioned nearby natural resources. For example, the US is investing in water from air systems that will generate 500 gallons of water per day and reduce the need for water storage and stockpiles.³² The US is also procuring Intelligent Power Management Distribution Systems (IPMDS) which will reduce power generation requirements and thus reduce the need for combat-heavy, trailer pulled, generator transport. Equally of importance for multi-domain combat sustainment will be Unmanned Aerial Vehicles (UAVs) that are capable of transporting goods and resupplying troops from longer distances without putting a soldier in danger; these UAV’s have already begun to be used in Afghanistan.³³ Clearly, these examples depict that the US is demanding efficient and smaller footprints from the sustainment community in the future front line of multi-domain combat.

³⁰ Peter Van Howe, “The Challenges of Multi-Domain Sustainment,” *Army Sustainment* 51, no. 2 (2019): 52.

³¹ Michael G. Dana, “21st Century Logistics,” *Marine Corps Gazette* 101, no. 10 (2017): 12.

³² Howe, “The Challenges of Multi-Domain Sustainment.” 51.

³³ Dana, “21st Century Logistics.” 52.

The US military also recognizes it must evolve their training program and employment model for sustainers preparing for the next fight. The main theme across the US forces when it comes to sustainment training for the multi-domain is the expectation that training must include realistic challenges to operating with degraded capabilities in multiple domains.³⁴ Threats such as cyber and electromagnetic warfare require sustainers not only to train to understand the Information Technology (IT) systems they utilize to manage the supply chain, but they must also recognize when their IT has been compromised, and subsequently how to switch to manual methods and continue supporting operations in analogue to support the war effort.

Traditional “soldier skills” once lost to static sustainment hub operations will have to be reintroduced as critical tasks for logisticians.³⁵ As mentioned above in the future US doctrine, maneuver, dispersion, and camouflage will become necessary to fight in the A2/AD space. Moreover, the dispersion of forces will require sustainers to be mobile and re-establish support areas across the battlespace. This maneuvering and construction of new supply nodes by sustainers must also be generating their own security and not consuming it; thus making logistician soldier skills essential.³⁶ The complex multi-domain battlespace will apply pressure for sustainers to also be proficient with greater spans of support such as battlefield communications repair and potentially manipulators of 3D printing to provide just-in-time spare parts.³⁷ Finally, most recently,

³⁴ Paul C Hurley Jr, Henry-Neill, and Brashears, “Sustainment Innovation for Multi-Domain Battle.” 8.

³⁵ Geoffrey S. Utter and Sean W. Thomas, “Sustainment Trends Observed at JMRC” (Washington: Federal Information & News Dispatch, Inc, 2019), 1.

³⁶ Paul C. Hurley Jr and Hugh H. “Hank” Coleman III, “What FM 3-0 Means for Expeditionary Battlefield Sustainment: Multi-Domain Battle Will Require Sustainers to Support Independent Operations over Long Distances While Focusing on Survivability and Precision,” *Army Sustainment* 50, no. 3 (2018): 2.

³⁷ Lt Gen Michael D Lundy et al., “Field Manual 4-0: Driving Sustainment Change.” 10.

the US Army Logistics University has launched a pilot program to cross-train the various officer-level sustainers in a broad spectrum of multifunctional logistics regardless of their branch affiliation or specialty.³⁸ All of these discussed changes to training and employment of sustainers are required to confront the complex, dynamic, fast-paced multi-domain where communications and situational awareness will be downgraded.

Critics of the theory of multi-domain operations suggest that the numerous papers and articles written on the future battlespace are nothing more than previous military theory wrapped in new packages. That perhaps, the increased discussion of the multi-domain is a strategic method to gain support and funding for the militaries around the globe. The description of the multi-domain environment being complex, dispersed, occurring in cyber and space in an instant, does energize proponents and corporations that support defence. Skeptics will point out that countries are not even aligned when defining what a domain is or how many domains exist. Canada has listed six domains, the US only speaks of five domains, NATO only recently agreed to a fifth domain for space, and others believe there should be a human domain.³⁹ Another argument could be that multi-domain is just another intellectual name for “joint”, as seen in all current concepts that the multi-domain frameworks speak fervently of a more robust joint force.

Regardless of the criticisms of multi-domain terminology, the reality is that all nations, including NATO, believe space and cyber are the next great contested areas for

³⁸ Kyle Smith and Howard Van Matre, “Developing the Next Wave of Sustainment Leaders,” *Army Sustainment* 50, no. 6 (2018): 5.

³⁹ Heather S. Gregg, “The Human Domain and Influence Operations in the 21st Century,” *Special Operations Journal* 2, no. 2 (July 2, 2016): 92–105, <https://doi.org/10.1080/23296151.2016.1239978>. 93.

power.⁴⁰ As the US Joint Operating Environment (JOE) 2035 states, “To think about the future usefully, we must describe change in a rigorous and credible way. Concurrently, we must creatively account for the unexpected, by stepping outside the assumptions and certainties that anchor us to today.” Future national defence must re-align doctrine, training, and employment of military forces in order to be successful in defending and projecting power into the space and cyber domains.

CAF SUSTAINMENT IN THE PAN-DOMAIN

One cannot use the US military sustainment enterprise to compare to Canadian CAF logistics activities. The grandiose scope of US military logistics and the huge corporations, partners, and stakeholders that ensure persistent, expeditious delivery of military goods worldwide, has no competitor.

U.S. Transportation Command (USTRANSCOM) provides daily examples of what it takes to keep U.S. forces and their sustainment moving around the world, conducting more than 1,900 air missions during an average week and has 25 ships underway and 10,000 ground shipments operating in 75 percent of the world’s countries. It does this with a total wartime personnel capability of 45,945 active-duty soldiers, sailors, airmen, Marines, and Coast Guardsmen; 73,058 Reserve and Guard personnel; and 19,104 DOD civilian personnel—numbers that do not include the significant contributions of USTRANSCOM’s commercial partners or the contributions of foreign entities. The actions of the Defense Logistics Agency (DLA) as supplier for the military are equally staggering in scope and scale. During fiscal year (FY) 2017, DLA provided more than \$35 billion in goods and services, coordinating the actions of 25,000 military, civilian, and contract personnel who provided food, clothing, fuel, repair parts, and other items across nine supply chains distributing approximately 5 million distinct consumable, expendable, and reparable items.⁴¹

⁴⁰ NATO, “Press Conference by NATO Secretary General Jens Stoltenberg Following the Meeting of the North Atlantic Council at the Level of Heads of State and/or Government,” NATO, accessed May 5, 2020, http://www.nato.int/cps/en/natohq/opinions_171554.htm.

⁴¹ “Logistics: The Lifeblood of Military Power,” The Heritage Foundation, accessed May 2, 2020, <https://www.heritage.org/military-strength-topical-essays/2019-essays/logistics-the-lifeblood-military-power>.

These are just two of the largest logistics groups in the US military and does not include the Army, Navy, Air Force sustainment where for example the US Army alone has 31 sustainment brigades compared to none in Canada. The CAF has a total of 11,085 logisticians including officers and nine Non-Commissioned Member (NCM) trades; with the largest grouping of support at the battalion level.⁴² However, there are lessons that can be garnered from studying US sustainment counterparts. As discussed, the pan-domain battlespace is changing how operators are analyzing, planning and conducting their task for future conflict. Similarly, the Royal Canadian Logistics Service (RCLS) will need to innovate their structure, training, and employment of personnel to achieve synergies across the spectrum of employment to ensure continued support to Canadian operations.

CAF Logistics Organizational Structure

Since 2012, the RCLS does not belong to any Level 1 (L1) organization; the Army, Navy, Air Force, and Canadian Joint Operations Command (CJOC) all own segments of the logistics tasks, units, and accountabilities. There is no one logistics commander overseeing strategic, operational, and tactical logistics, synchronizing logistics effects across training and employment, prioritizing support to operations domestically or abroad, managing national stocks and procurements, or seeking efficiencies across the elements. From 2006-2012, there was a separate Canadian Operational Support Command (CANOSCOM) that had its own logistics commander. However, the 2011 General Leslie Report signaled another transformation had to occur after the Afghanistan War to reduce positions and CJOC was created to re-integrate two

⁴² DGMC CAF, "Personnel Strength and Establishment Table," July 2019.

separate commands in Ottawa (CEFCOM and Canada Command).⁴³ He recommended that CANOSCOM would remain a separate entity with its own commander, nevertheless, DND decided to combine all three commands into a single entity that exists today. The ADF, which is similarly resourced as the CAF, created a Joint Commander for logistics in 2017 in order to harmonize logistics effects. The Commander Joint Logistics (CJLOG) is accountable to the Vice Chief of the Defence Force (VCDF) for command of Joint Logistics Command and through VCDF for delivering Defence Logistics support to the ADF.”⁴⁴

In consideration of the changing nature of conflict in the pan-domain as championed by many senior US, Canadian, and Australian military leaders, the CAF should once again adopt a singular command for logistics. As discussed, to be able to operate in the pan-domain, delivery of all military effects will need to be dispersed, act autonomously, maneuver quickly, utilize IT to make rapid decisions, and have low level authorities to execute battlespace effects. With logisticians making up the majority of the force either domestically or internationally, it is crucial to have a single point of command to manage the CAF joint sustainment enterprise efficiently with trusted individuals who can make sound judgment decisions on all matters of logistics regardless of element. A Joint Sustainment L1 could establish and maintain a system to direct, coordinate and evaluate logistic support throughout the pan-domain; permitting operators to seize their area of expertise in the complex battlespace and leave logistics command and control to a joint logistics commander. Additionally, a single commander would be responsible for sustainment Force Generation (FG), thus overseeing the training and employment challenges

⁴³ National Defence, “Report on Transformation 2011,” education and awareness, aem, July 12, 2013, <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/report-on-transformation-2011.html>.

⁴⁴ Australian Defence Force, “Joint Logistics Command,” Text (Government Online Directory, June 2, 2017), <https://www.directory.gov.au/portfolios/defence/department-defence/joint-capabilities-group/joint-logistics-command>.

that are already occurring and will be ever more complex in the pan-domain. In contrast, the current CAF logistics training system is owned and managed by Chief Military Personnel (CMP) with the largest service in the CAF, the RCLS, not having authority of their own logistical FG. Where the US and Australia logistics commands are emphasizing innovative and modern training, the CAF woefully lacks a cohesive plan from a single sustainment commander who should own the problem space.

Logistics Training and Employment

Logistics Officers are currently trained at the Canadian Forces Logistics Training Centre (CFTLC) in Borden, Ontario. CFLTC is a CMP unit that employs logisticians from nine different NCM trades and the logistics officers, across all three elements, to manage the school and train members in sustainment. For the officers, their CFLTC training includes a common course with Army, Navy, and Air Force that covers basic information on all specialties within the Logistic Officer trade. Students are briefed the very basics of all core streams of Human Resource (HR), Supply, Transport, Finance and Food Services and amounts to a total of 27 training days. Following the common core, each student is selected for more in-depth training in only one of the core streams above for approximately 22 training days. The next stage of training is suited to applying logistics in an operational setting pertinent to their uniform environment (Army, Navy, Air), and is an additional 22 training days. All of this training is usually done back-to-back over a summer immediately following Officer basic training. This creates a logistician that will have achieved full functional training within six months of entering the CAF and ready to fulfill managerial roles at wing or base. The core logistics training in total is only 64 days. Of note, only the Navy has chosen to mandate that their students will complete both finance and supply for their in-depth core streams vice the single option for the Army and Air Force.

For officers who entered the CAF with a non-business-like degree, this training at CFLTC is their first foray into management of commodities, be it materiel, human resources, or financial resources. For the rest of Canadian society, to be employed in an equivalent role in the private sector, students would need a hard-business undergrad and likely a Master of Business Administration (MBA). However, a CAF logistician receives 64 days of specific logistics training and that is all until the rank of Major with another five-week course. When compared to equivalent private sector Supply Chain Managers or Business Operations Managers the CAF is well below the targeted training in the corporate logistics realm and the CFLTC program would not likely be considered on par for a college diploma.

There are gaps in the logistics training that have been recognized for at least the past decade, if not longer. The changing environment of IT and business enterprise solutions such as IBM SAP, used within the CAF, have signaled a recommended change for more education on Project Management, Business Process Management, Performance Metrics, and Business Analytics/Intelligence. These were key areas of business operations that were identified as far back when Google Analytics was created in 2005 and kick started a new business science.⁴⁵ CAF logisticians, unless they seek additional education for themselves do not receive any training in these specialized business topics, nor are they covered at CFLTC as of yet. To add to this lack of business intelligence, the logistics community operates at least five major business solutions software systems that logistics officers are also not given any mandated training on but are expected to manage and “analyze” those systems. These two examples of limited CFLTC training and missed opportunities learning leading edge business intelligence solutions, are in

⁴⁵ The Associated Press, “Google Acquires Urchin Software,” *The New York Times*, March 29, 2005, sec. Business, <https://www.nytimes.com/2005/03/29/technology/google-acquires-urchin-software.html>.

stark contrast to the operational environment as described by the CDS in the future pan-domain battlespace. CAF logistics is already significantly lagging behind the current battlespace we know, let alone the pan-domain zone.

CAF logisticians must change their educational system to meet the future multi-domain environment that will necessitate rapid decision making through use of business intelligence, in dispersed, degraded and contested areas, and provide holistic sustainment solutions that include all core areas of logistics. The future logistician must become a specialist of the entire logistics enterprise and no longer be beholden to a single core specialty, and become a truly *joint* supporter.⁴⁶ The CAF should reorganize the logistics training model for supply, transport, ammunition, food services and postal officers to become a single Sustainment Officer much like the US military structure. Generally speaking, the above individual officer specialties all manage the same thing – a commodity. Managing a commodity in business operations is relatively the same with a few technical differences. There are no university programs that teach how to manage one commodity, there are business management degrees where the theory, processes, and solutions are cross cutting throughout any business product. The CAF must move away from their historic “*silo-ization*” of logistics. HR and finance would remain as independent occupations as they are specialized trades that are outside of supporting the true sustainment enterprise. These two trades do not effect battlespace sustainment, they manage the human and financial resources to *employ* the sustainment enterprise. Therefore, the CAF should create a new trade, the Sustainment Officer, where training can be targeted to true business management, business operations, and business intelligence. This forward direction will undoubtedly see gains in the future pan-domain environment. Sustainment officers with knowledge of every commodity

⁴⁶ Smith and Matre, “Developing the Next Wave of Sustainment Leaders.” 5.

would decrease the positions required on deployments, passage of information and decision making would be efficient and synchronized, and decision authorities could be pushed down farther with the decrease of logistics officers requiring approvals from single commodity specialists. Versatile logisticians are required to anticipate and act within all the components of the sustainment chain and may have to do so with degraded, decentralized Command and Control (C²), cyber-attacks, and analog scenarios in the pan-domain.⁴⁷ The CAF should create a sustainment officer to be accountable for all logistics in the future pan-domain battlespace.

Finally, as discussed, US military logistics is “*the*” undisputed global sustainment chain specialists. The PFEC states that the CAF must be grounded in the principle of multi-national planning.⁴⁸ International sustainment for the CAF frequently involves US logistics provisions for life support services such as feeding, fueling, camp infrastructure, and transport. The pan-domain concept will require even greater integration with US partners and other coalition members as the CAF cannot provide independent sustainment overseas, in a contested battlespace, for a long duration as seen during the Afghanistan and Iraq wars. Sustainment Officers must be provided multi-national planning training early in their careers and yet again there is no such training available today at CFLTC. The pan-domain will absolutely require the amalgamation of nations sustainment capabilities to achieve effects and the CAF must have personnel able to collaborate efficiently at the sustainment level, not commodity level.

Although the advantages of IT and the call for improved training of business enterprise software and data analytics has been discussed, there is also a great need for training without these systems. The pan-domain will likely face the challenge of a contested cyberspace and

⁴⁷ Dana, “21st Century Logistics.” 13.

⁴⁸ Chief of Defence Staff, “DRAFT//Pan-Domain Force Employment Concept: Prevailing in an Uncertain World.” 20.

degraded communications that will force logisticians to operate on analogue or manual systems to manage critical stock levels, fulfill combat demands, track shipping timelines, and request urgent operational requirements. In other words, logisticians need to be able to manage and function across the sustainment chain without all the normal IT tools they are used to. Add to this manual tracking, the need for dispersed stockpiles of equipment on the battlefield to avoid a centralized electromagnetic signature on a single source supply node and again the importance of a sustainment officer vice a commodity specialist is realized. A logistician with only specialization of one commodity will not be able to coordinate movement of entire logistical nodes without collaboration from the other specialists. In this regard, CFLTC must introduce training methods to incorporate realistic challenges of operating with degraded capabilities in the pan-domain.

A counter argument for not creating a single Sustainment L1 organization and changing CAF logistics training, and employment would be to remain status-quo. Despite allied military sustainment peers changing to a single logistics command and all-around sustainment officers, the RCLS would remain with five logistics specialties with no single champion for logistics across the CAF. This structure is commonly recognized and understood in the CAF. Critics to change would say that there are no logistics problems with the structure that exist today and that operations are always supported. Additionally, they believe L1 Commanders would not be willing to consolidate members away from the Army, Navy, Air Force, and CJOC to an RCLS Command for fear of losing employment flexibility. However, the current L1's have minor input on employment and training of logisticians. Employment of logisticians are still managed through the RCLS but through a complex process of agreements between stakeholders at SJS, CJOC, L1s, CMP, and Career Managers. An RCLS Commander could immediately see

efficiencies, opportunities, and redundancies across the service and make effective decisions on how best to support operations domestically and internationally.

CONCLUSION

The future pan-domain battlespace will challenge military forces to perform in near-peer adversary environments where continuous superiority across any domain is no longer guaranteed. Forces must change their doctrine and tactics to succeed in a widely dispersed, highly contested, and vulnerable A2/AD battlespace. To sustain these new operations, the CAF must make succinct and direct changes to the RCLS command structure, training, and employment of logistics officers. Achieving this will require a change in mindset to those who manage logistics now. The CAF must consolidate logistics specialists into their own L1 organization to synchronize their planning, processes, and outputs. Equally important is creating a Sustainment Officer who is an all-inclusive logistician so that decision power and authorities can be pushed down to where decisions need to happen quickly. And finally, training of RCLS personnel must reflect the discussed foreseeable pan-domain realities of working with powerful business analytics tools and IT, or conversely with degraded IT. Changing CAF operational logistics is a slow process and cannot outpace how combat operators will plan to fight in the pan-domain. However, the RCLS can make immediate improvements now to prepare for supporting conflict in the pan-domain; waiting for logistics AI and robots to sustain the force is much too far away to rely upon as an operational support plan.

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