

CANADIAN ARMY



TODAY

FALL 2020 | VOL. 4 | ISSUE 2

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Photo: Avr Zamir Muminiar

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EDITOR'S NOTE



Six months ago, in this space, we commented on the importance of the Army Reserve to domestic emergency response. The context was Operation Lentus, and in particular the flooding in eastern Ontario. But the Canadian Armed Forces had just begun contingency planning to deal with an emerging novel coronavirus and it seemed inevitable the Reserves might again play an important role.

Just a few months later, hundreds of Reservists deployed into long-term care facilities in Ontario and Quebec, a mission neither the Army Commander nor Canadian Joint Operations Command saw coming, despite running through multiple scenarios of what might transpire and the requests for assistance provincial governments could ask. It was a further reminder of why initiatives like Strengthening the Army Reserve and investments in Reserve infrastructure matter.

In this issue, we share some of the stories from the front lines of the pandemic. Members of several Domestic Response Companies describe their experience of deploying into the unknown and how it affected them. The Commanding Officer of 1 Canadian Ranger Patrol Group explains how members responded to food shortages and conducted wellness checks in communities across the Territories. And 4th Canadian Division's Arctic Response Company Group shares their training regime for a worst-case mission that fortunately never came.

We also look at the consequences of putting much of the force generation system on pause for almost four months. For 2nd Canadian Division, it will mean a road to high readiness unlike any in recent memory. For most, though, it has resulted in a gradual resumption of professional development courses and individual training that are now in full swing.

Collective exercises, however, may take much longer to return. And that comes with a cost. "By canceling Exercise Maple Resolve last year, we have lost some proficiency at the brigade level," Army Commander LGen Wayne Eyre acknowledged. "This is a risk we are assuming eyes wide open. We are going to be making up that shortfall over the course of the next few years."

Certain capabilities need the challenge of a brigade-level exercise to get a proper "workout," he noted, including engineer regimental headquarters, artillery regimental headquarters, and service battalions when they are conducting sustainment at scale. "That is going to be the critical one: How do we not learn the wrong lessons when we are not exercising in real life the entire enterprise."

Smart organizations capitalize on disruption. And pandemic or not, the Army is proceeding with a modernization strategy that will introduce an adapted Managed Readiness Plan and could significantly change the future force structure. In our lead feature, Eyre explains what's driving that strategy and the major lines of effort.

Chris Thatcher, Editor

CONTRIBUTORS

Publisher & Editor: Christopher Thatcher
Contributing Editor: Ken Pole
Contributing Editor: Ian Coutts
Contributing Editor: Allan Joyner
Contributing Writers: Mark Kusi-Appiah, Don Parker, Andrew McLaughlin, George Nikolakakos, Maude Amyot-Bourgeois, Dominik Pudo et al., Noel Mackey
Photographers: Allan Joyner, Daniel Rogall
Contributing Photographers: Sgt Nathan Barbary, Shelby Barton, Cpl Genevieve Beaulieu, Cpl Valerie Côté, MCpl Rod Doucet, Cpl Justin Dreimanis, Cpl Laurian Ene, Cpl Stuart Evans, Capt Gabriel Ferris, Sgt Craig Fiander, Cpl Peter Ford, Cpl Jordan Fountain, Sgt Marc-André Gaudreault, Cpl Éric Girard, LCpl Jose Gonzalez, MCpl David, Hardwick, WO Jerry Kean, MCpl Jax Kennedy, Pte Robert Kingerski, Cpl Darcy Lefebvre, 1st Lt Angelo Mejia, Cpl Cody Misner, Pte Sarah Morley, Cpl Nathan Moulton, Avr Zamir Muminar, MCpl Brandon O'Connell, Capt Felix Odartey-Wellington, Pte Daniel Pereira, OS Alexandra Proulx, AB Camden Scott, Sgt Bruno Turcotte, Cpl Djalma Vuong-De Ramos
Content Coordination: Directorate of Army Public Affairs
Graphic Design: Stoneway Creative Inc.
Web Development: Wavelength Media
Social Media: Allan Joyner Productions
Advertising: Christopher Thatcher

CONTACT US

We welcome article ideas and feedback.
Phone: 613-983-8141
Email: editor@canadianarmytoday.com
Mail: 300 Greenbank Road, Unit 2, Ottawa, ON, K2H 0B6
Web: www.canadianarmytoday.com

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subscriptions@canadianarmytoday.com

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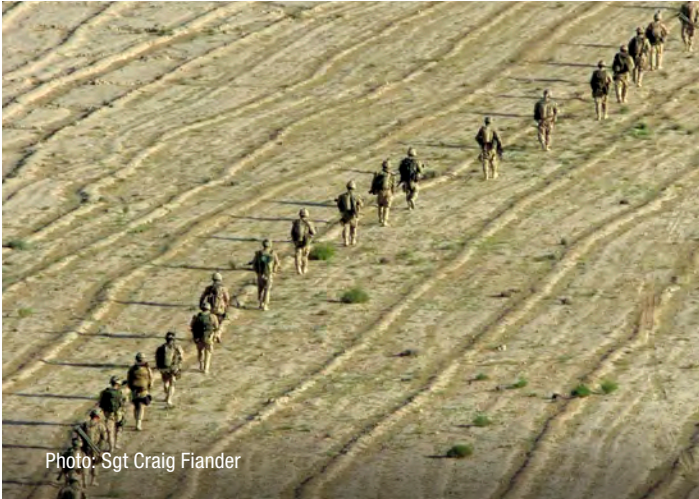


Photo: Sgt Craig Fiander



Photo: OS Alexandra Proulx

NEW ORDER AIMS TO “DECISIVELY ADDRESS” HATEFUL CONDUCT

The Army Commander has issued a directive to stamp out racism, discrimination and hateful conduct. In an organization of almost 50,000 Regular and Reserve Force members, Canadian Rangers, and civilian employees, the occurrence of such incidents has been relatively small, “but one case is one too many,” LGen Wayne Eyre said in an interview in September shortly after issuing the Canadian Army Order (CAO).

Hateful conduct, including harassment and micro-aggression, “erodes so many aspects of who we are,” he explained. “It erodes the trust we have with our population, if we are not reflecting the values of our country. It erodes our cohesion, which underpins our operational readiness. And it erodes the trust that individuals have in the institution. If we don’t address it, we are harming our own people, harming our readiness, and harming our relationship with our own country.”

The directive defines the behaviour the Army seeks to prohibit, including affiliation with organizations promoting hate or violence against “a person or any identifiable group based on a prohibited ground of discrimination.”

That includes the display of tattoos that “communicate, constitute, encourage, justify or promote violence or hatred.”

“We’ve got to be seized with this before it grows into a larger problem,” said Eyre. “What concerns me is, we see the toxicity in our society – call them the echo chambers of hate that are out there, the rise of some of these hate groups and perhaps the allure they have for some individuals in society. Well, they have no place in our organization.”

The CAO describes three lines of effort: Prevention through proactive education; responses such as encouraging members to speak up when they witness or become aware of incidents and holding members to account for their actions; and an assessment process that involves Army contribution to Canadian Armed Forces-wide mechanisms to report, track and assess incidents.

Along with Eyre’s intent, the directive details the procedures and processes units are to follow when hateful behaviour is reported to the chain of command. “Failure to act is considered complicity in the event,” according to the CAO.

Several incidents in the past year have shone a spotlight on the

conduct of a few in the ranks. A CBC News investigation this past summer found that some serving Canadian Rangers had expressed support in social media accounts for far-right groups such as the Three Percent movement and the Soldiers of Odin. In January, Patrik Mathews, a former Reservist, was arrested by the FBI and faces trial in the U.S. for recruiting for white supremacist groups.

The CAO builds on direction from the Chief of the Defence Staff and Military Personnel Command and was completed following feedback from Army senior leaders during a virtual symposium in September. Over 450 Regular and Reserve Force leaders from units in Canada and deployed globally were able to participate for the first time in the annual event that normally takes place in Ottawa with a much smaller audience. “We talked about a lot of issues, but this was one of the key ones,” said Eyre. “The feedback I’m getting is that it was well received.”

The Army, along with the rest of the Canadian Armed Forces (CAF), is in a talent war with Canadian industry for engineering- and computer-savvy young Canadians as it introduces technologically complex equipment and builds cyber and

information operations capabilities. It’s a battle Eyre is well aware of.

“What we offer that these tech companies don’t is purpose,” he noted, “and there is no higher purpose than serving your country. But we have to do everything we can to make sure the environment and the workplace is agreeable for that talent.”

The directive comes at a time when many western militaries are wrestling with the same challenge as hate groups encourage participation in armed forces to acquire firearms and other military skills.

“The United States armed services and their counterparts in allied countries must close off all means by which white supremacists, anarchists, or fascists enter our national institutions and social mainstems,” Gen (Ret’d) James Jones, a former commandant of the Marine Corps and Supreme Allied Commander of Europe, wrote in *The Atlantic*. “The military must study what might attract hate groups and extremists to join or recruit from its active-duty ranks and its veterans.” ■



Portable Electric's VOLTstack with solar panels, a green solution it could position for the Tactical Power Systems project. Photo: Portable Electric

POWERING UP THE NEXT GEN OF GENERATORS

If ever there was a project that proved no defence acquisition is ever as straightforward as it seems, perhaps it is Tactical Power Systems (TPS). The Canadian Armed Forces (CAF) inventory of tactical generators includes 50 different types, some 3,000 in all under 60 kW, to power everything from command posts and computers to heaters, lighting and the all-important coffee pot.

Most are at the end of their service life and costly to maintain. They also fall well short of the CAF energy and environmental standards and the 2017 defence policy objective of reducing petroleum-generated electrical energy in deployed camps by 50 percent by 2030.

When the project team at the Directorate of Land Requirements explored replacement options, weighing cost against the most environmentally friendly capability was among 10 key factors. Should they go with new more fuel-efficient generators, a mix of new generators in combination with energy storage such as batteries, or generate power from non-fossil fuels in combination with energy storage? All options would need to include new distribution systems.

The third option was beyond the project budget, so the team is

bringing forward the second for industry feedback, said Major Don Parker, the project director. "We were approved to plan for a mix of green and white (commercial) fleets. The white fleets are cheaper and would allow us to get more capability for the money. [But] we need more industry feedback to see if the white/green concept is feasible from their perspective."

That will likely happen early in 2021 in the form of a request for information. The request for proposals would follow by 2023.

Parker said the mix of generators, which could reduce fuel consumption by up to 40 percent in some circumstances, would allow the CAF to deploy white fleets for training events and domestic operations and reserve the green fleet for high-threat international operations.

Though the Army is not yet naming potential bidders, a number of Canadian companies are eyeing the project with interest. One with a green solution is Portable Electric of Vancouver, B.C. Founded in 2015, the company offers a line of robust, renewable power systems, VOLTstack, that have their origin in the oil sector. Founder and chief executive officer Mark Rabin, a petroleum geologist, saw the need

for off-the-grid power at numerous field sites and quickly realized "you could not rent an industrial-grade renewable power system. That's when we said, 'We need to build prototypes and get them out in the field'. The idea was, anywhere you need temporary and mobile power, we can provide a solution."

The VOLTstack line, which is designed, manufactured and maintained in Vancouver, offers rapid micro-grid set up and can be solar charged or connected to electric vehicle infrastructure.

Portable Electric began with events and festivals and soon caught the attention of the film industry, where low-noise generators are an obvious plus and sets often resemble a mini village that is frequently relocating. By 2018, Rabin was getting calls about disaster relief. He travelled with some generators and technicians to North Carolina after Hurricane Florence swept through.

"That was eye-opening," he said. The company established micro grids to relieve exhausted homeowners who had generators but no longer the wherewithal to drive three hours for gas. "We definitely saw that fuel supply chain risk."

The company is now exploring military applications as projects like

TPS move through the procurement process and the Innovation for Defence Excellence and Security (IDEaS) pop-up city challenge seeks solutions for reliable, efficient, integrated and scalable energy, water and waste management systems for temporary camps.

"There are a bunch of attributes of our renewable energy systems that would fit well with forward operating bases. Obviously, there is no noise, no heat, no plume. They are portable and you can charge them from base camp."

Rabin has applied for the IDEaS challenge but as of August had yet to hear back. (The program paused some of its activities during the pandemic and the pop-up city contest is scheduled to resume in 2021.) "The struggle here in Canada is we tend to barely support technology in our own backyard," he observed, though he noted, Portable Electric "had to get better at understanding the [government] procurement process."

If the company's energy and distribution systems fit some of the TPS or IDEaS criteria, Rabin is open to any arrangement. "It is not a one size fits all type of solution. We would look to sell, lease or partner." ■



Members of 1 Service Battalion conduct Exercise Rough Rider in Wainwright, Alta., in September 2020. Photo: Cpl Djalma Vuong-De Ramos

THE ROAD TO NEW LOGISTICS TRUCKS

BY IAN COUTTS

“It’s déjà vu all over again.”

That famed phrase attributed to Yogi Berra probably sums up the thoughts of anyone who has been following the Army’s continuing efforts to find replacements for its fleet of light and heavy logistics vehicles.

Readers may recall that three years ago the Army announced it was in the process of creating a draft version of a request for proposals (RFP) to be sent out in the summer of 2018, followed by the final RFP in 2019. From there the contract would be awarded in 2020 and by 2025 the two new fleets of trucks and trailers would both be in place, ready to serve for the next 20 to 30 years.

Not before time. The Army’s current Light Support and Heavy Logistics Vehicle Wheeled (LSVW and HLVW) fleets are more than two decades old, and the parts to keep them going are getting scarcer and scarcer.

Today, the status of the project sounds strangely familiar, harkening Berra’s oft-repeated quote. The project team is currently working on a draft version of the RFP, with the completed version due to go out next summer. A contract would then be awarded in 2022 or 2023, followed

by first delivery in 2025-26, initial operational capability in 2026-27, and the full operational capability by 2029-30.

In the meantime, the existing light and heavy vehicle fleets will need to keep rolling, an additional three years on their weary frames.

Perhaps a too-familiar tale of defence procurement. But there are reasons to be optimistic that this time the project will go ahead. Two things have changed, says Major Kevin Duff, the project director with the Directorate of Land Requirements: the government’s 2017 defence policy, Strong, Secure, Engaged (SSE), and money.

“The program was in options analysis for a long time and the challenge was always trying to secure the money,” he explained. Inclusion in SSE comes with a rough budget for acquisition, infrastructure and contingencies of between \$1 billion and \$5 billion.

The broad strokes of the procurement remain the same, however. For the replacement of the LSVW, the Army is looking at between 650 and 1,100 vehicles, though these are preliminary figures, Duff acknowledged. The new vehicle is expected to carry out a range of roles, from command post, to

ambulance, to field workshop.

For the heavy logistics vehicle, the Army hopes to acquire between 300 and 550 heavy trucks, 45 of which will be capable of pulling 72,000 kilograms – a battle tank on a trailer essentially. More significant for potential vendors, the requirement that the vehicle already be in service with a NATO ally to ensure its reliability remains in place.

But there have been a few changes. “We’ve upped the capacity of the light truck,” said Duff. “We’ve developed a better sense of everything this vehicle is going to be required to do and carry, so we’ve upped the requirement to four to five tonnes (from the previously required 2.5 to 3.5).”

Another big change: “Originally, we were just procuring a protection system for the heavy truck. We’re now going to make sure the light truck has the ability to accept armour as well,” he said. The new Medium Support Vehicle System (MSVS) Standard Military Pattern trucks now in service include an armoured cab when deployed on international operations.

And although the Army insists that the vehicles under consideration currently be operational, “there has been some evolutionary

development” Canada would like to capitalize on, noted Duff. He cited greener engine technology as one feature the Army would like to see in its next logistics trucks.

Following an invitation to qualify issued in April 2019, Public Services and Procurement Canada announced a list seven qualified suppliers with the technical ability to meet the requirements: Daimler/Mercedes-Benz, General Dynamics Land Systems-Canada, Iveco Defence Vehicles, Mack Defense, Navistar Defense, Oshkosh Defense, and Rheinmetall Canada and Rheinmetall MAN Military Vehicles.

The Army is currently developing what Duff called a “very robust physical testing program.” Perhaps a sign that this time really is different, the Army recently signed an agreement with the Nevada Automotive Test Center, a company expert in evaluating all kinds of vehicles, civil and military, that was also used in the selection of the new MSVS.

“We learned a lot with what we did with the medium fleet,” said Duff. Now the project team will be applying that knowledge to acquire the next generation of light and heavy logistics trucks. ■

BROWNING HI-POWER PREPARES TO MEET ITS REPLACEMENT

Handgun manufactures could have a request for proposals (RFP) to mull over in the early New Year. The Department of National Defence intends to move forward with a project to finally replace the nine-

millimetre Browning Hi-Power semi-automatic pistol worn by Canadian Armed Forces (CAF) members on deployment.

An RFP for the General Service Pistol replacement project will be

issued in winter 2021 and a contract should be awarded by next summer, an official with the Assistant Deputy Minister (Materiel) branch confirmed.

The intent is to acquire a minimum of 9,000 full-frame, modular automatic pistols in an “initial buy” to support Army requirements. First delivery would be by the summer of 2022. However, the total contract could involve between 15,000 and 20,000 pistols.

“The precise number has not yet been confirmed as it will depend on requirements,” the official said.

ADM (Mat) won’t disclose the project budget details just yet, but the acquisition will be an open, competitive process. Colt Canada is the military’s Small Arms Strategic

Source and Centre of Excellence and has been selected under the Munitions Supply Program to provide most of the Army’s small arms in recent years, including the new C6AI FLEX general purpose machine gun and new Canadian Ranger C-19 .308s rifle, based on the SAKO T3 compact tactical rifle.

The pistol replacement, however, is “going to be a competitive process,” the official stated.

The Browning has served the Army well over many decades, but parts are scarce and Colt has often had to cannibalize components from the remaining in-service weapons to provide deploying troops with a working pistol. ■



A soldier fires the Browning 9mm pistol during the Canadian Armed Forces Small Arms Concentration in September 2019. Photo: AB Camden Scott

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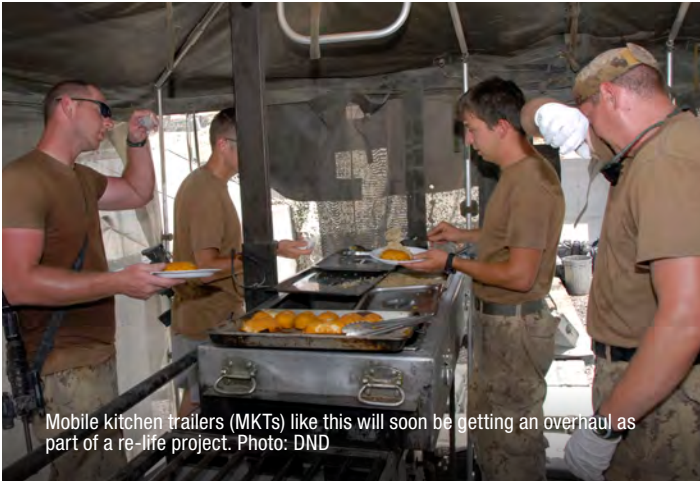
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A SECOND SERVING FOR THE ARMY'S MOBILE KITCHENS



Mobile kitchen trailers (MKTs) like this will soon be getting an overhaul as part of a re-life project. Photo: DND



Cpl Ivy Hawco of 37 Service Battalion in a mobile kitchen during Exercise Saffron 2018 in Halifax. Photo: Capt Felix Odartey-Wellington

BY MAJOR NOEL MACKEY

The old Napoleonic adage that “an army travels on its stomach” is perhaps the most basic military principle that militaries have succeeded and failed to satisfy throughout the history of armed conflict. The importance of field fresh rations is paramount to successful operations – indeed, it’s a force multiplier.

Unlike many of Canada’s allies who for reasons of efficiency and ease have pivoted to serving preserved “boiled meals in a bag,” the Canadian Army continues to hold fast the need to provide fresh cooked meals. The quintessential platform that enables fresh ration feeding for the Army is the mobile kitchen trailer (MKT).

The MKT has been the backbone

of serving fresh and hot food to tired and hungry soldiers for the last 30 years. The MKT is designed to feed groups of up to 150 personnel and it offers the most flexible capability as it can be positioned, stabilized and sheltered to deploy on almost any ground and during demanding weather conditions. It has been deployed around the world from the coldest Canadian winters to the hottest deserts of Afghanistan.

The current MKT fleet is showing significant wear as aged mechanical systems deteriorate and parts obsolescence continues. The net effect of this reduction in field feeding capability is a greater reliance on feeding platforms that are non-tactical, less capable, or oversized for Company and below feeding

operations. The planned procurement of a replacement fleet is not forecasted until the 2030 timeframe.

To alleviate this capability deficiency, Director Land Requirements and Director Support Vehicles Program Management have commenced the MKT Re-Life project with Corrections Canada (CORCAN). CORCAN will be refurbishing existing MKTs by conducting structural repairs on platforms as well as replacing the brakes, electrical lighting, propane supply, and installing new burner systems.

Through this initiative, CORCAN will be employing offenders and training them in trade skills such as material fabrication, welding, gas fitting and electrical/mechanical repair. These offenders will receive

transferable trade skills that can help them contribute to society once their sentences are finished.

Collaborating with CORCAN has afforded the project team a high level of flexibility in negotiating the statement of refurbishment work and enabled the production line to adapt to a wide range of trailer defaults as the serviceability of some MKTs are worse than others.

The MKT re-life project is set to run until 2023 while it refurbishes three per month. It is scoped to deliver between 80 and 100 MKTs back to the Army. Production intake and output will ensure that when a unit is ready to send a mobile kitchen, a refurbished trailer will be ready for issuance to that unit. ■



The Joint Task Force North Command Team served supper to members on Operation Nanook in 2010. Photo: MCpl Jax Kennedy



A member of 36 Service Battalion lifts fresh cookies from a baking sheet in an MKT during Ex Strident Tracer 2015. Photo: WO Jerry Kean

DEW, SUPACAT TEAM FOR SOF FIGHTING VEHICLE

BY GREG BURTON

In July 2019, National Defence announced the intention to procure approximately 55 to 75 Next Generation Fighting Vehicles (NGFV) to replace the existing High Mobility Multipurpose Wheeled Vehicles (HMMWV) used by the Canadian Special Operations Forces Command for expeditionary operations.

Formal industry engagement commenced with a letter of interest and request for information (RFI) about the high-level mandatory requirements, which included survivability, lethality, mobility, electrical architecture, durability and sustainability, transportability, interoperability and reliability.

To augment the RFI, a voluntary demonstration was offered for industry to present their vehicles in an interactive environment. Participants were expected to best meet the mandatory requirements with mature and high technology readiness platforms.

The demonstration took place in Petawawa, Ont., between October and November. Information gleaned will enable National Defence to refine and finalize program requirements and support concepts.

DEW Engineering and Development (DEW) of Ottawa, Ont., and Miramichi, N.B., has been following the NGFV program since its inception in the early 2010s. DEW has a long history of successfully delivering life extended and upgraded Canadian armoured vehicles and logistics vehicle completions, either as a prime or a team member. The most recent examples include the LAV II Bison re-role and MSVS MilCOTS.

DEW also has a long history of developing, testing and manufacturing ballistic and blast armour. Virtually every legacy vehicle type in the Canadian Army has been equipped with DEW armour since 1994. DEW is the largest



The Supacat High Mobility Transporter has been battle proven on operations across the globe. Photo: DEW Supacat

manufacturer of composite armour in North America, supplying to General Dynamics Land Systems and General Dynamics Land Systems – Canada for all U.S. Army Stryker vehicles, RG31 Mine Resistant Ambush Protected vehicles, and other international customers.

DEW armour has saved the lives of countless Canadian, U.S. and allied soldiers and police officers. With that in mind, “DEW looked for a partner for the NGFV program that had a history of designing, building and delivering superior Special Forces vehicles,” said president Ian Marsh. “In Supacat, from Devon, England we found the right firm.”

Supacat’s High Mobility Transporter (HMT) is an expeditionary vehicle with exceptional off-road performance. In particular, its air bag suspension provides a very stable firing platform, and significantly lowers user fatigue, enabling operators to arrive ‘fit to fight’ at their objective.

Since the early 1980s, Supacat has designed a family of modular, high mobility vehicles that can be tailored to meet customer requirements. Over 1,000 have been procured by Special Forces in the U.S., U.K., Australia, Denmark, New Zealand and Norway.

“The HMT is often quoted as the Special Forces vehicle of choice and is in service with four of the Five

Eyes nations,” said Phil Applegarth, director and head of Supacat. Indeed, Supacat is keen to close the Five Eyes interoperability loop with Canada.

The name High Mobility Transporter may sound innocuous, but its key missions are direct action in support of counterterrorism, high value task operations and conventional warfare. The HMT is designed to transport personnel and equipment into operational zones, including directly onto objectives and to support the exit of other assets.

The HMT is robust and well-protected, enabling long range and enhanced mission duration, highlighting the payload and self-sustainability of the patrol. It provides the crew with various options for engaging adversaries without dismounting from the protection of the vehicle.

The DEW Supacat team will offer the new HMT Extenda Mk2. This vehicle has the unique feature of being convertible between 4x4 and 6x6 within hours, by adding or removing a third axle module, offering flexibility to reconfigure the vehicle to meet different operational requirements and environments.

The HMT can be fitted with NATO Generic Vehicle Architecture to enable the integration of a wide variety of mission systems, including remote

weapon systems, sensors, and C4 systems. It is also a superb joint fires effects vehicle.

Of course, the HMT is air portable and has been certified by a number of user nations with different aircraft. Operators can select between open or closed cabs, scalable levels of protection, seating layouts and payload configurations.

“The HMT is ITAR free and can be supported by the Supacat global supply network, which includes our Canadian teammate DEW Engineering,” said Applegarth.

Supacat undertook a rigorous program of trials to verify the performance of the HMT Extenda. It successfully completed two 12,500km tours of Australia in two weeks to verify reliability and performance over long distances.

Although the Petawawa demonstration was not the same as the Australia trials, the HMT Extenda amply demonstrated its mobility over a broad sampling of terrains and weather conditions.

“I have no doubt there will be stiff competition to win NGFV, but I am confident that the DEW Supacat team have a winning next generation fighting vehicle,” said Marsh. ■

Greg Burton is senior director, Strategic Business Development, for DEW Engineering and Development.

Adapting to COVID

The Army Surgeon's guide to navigating a pandemic

By Chris Thatcher

If you have ever transferred into a job in the midst of an emergency, you can probably empathize with Colonel David Coker. On Apr. 6, he was promoted to his current rank and named Canadian Army Surgeon, a role that involves providing health and medical advice to the Army Commander and the Army's doctrine and training system, as well as serving as a liaison with Canadian Forces Health Services and with the Division surgeons across the country.

Coker has deployed as a trauma physician to Afghanistan and, in 2017, as the commanding officer of the Coalition Role 2 hospital in northern Iraq. Over 23 years of service, he's also held positions in 2 Field Ambulance, as 2 Canadian Mechanized Brigade Group surgeon and as



Col David Coker

5th Canadian Division surgeon. Still, stepping into a largely deserted Army headquarters in the early days of a pandemic, when much about the spread of the coronavirus was unknown, was “an interesting time,” he mused. “I was promoted over the internet. It was one of the first Zoom promotions for [CFHS].”

At the time, the Canadian Armed Forces (CAF) was working from a contingency plan, Operation Laser, informed by past experience with an outbreak of severe acute respiratory syndrome (SARS) in 2002 and a global influenza virus (N1H1) pandemic in 2009. “Those plans are big hands, small map in that they provide guiding principles for how we might react to a domestic pandemic, and they try to predict what the ask



Reservists from 35 Canadian Brigade Group arrived at the Saint-Jean Garrison on May 10 to receive geriatric care training as part of Operation Laser. Photo: Avr Zamir Muminjar

will be if there is one,” Coker noted.

Canadian Joint Operations Command, which led Op Laser, had conducted “war gaming” in advance of the pandemic to consider possible scenarios, including a request to augment overrun hospitals by supporting pop-up care centres for overflow patients with low acuity. Of all the permutations, providing relief in long-term care facilities was not in the mix.

“If you had told me at the beginning of March that our major task would have been intervention in long-term care facilities, I’m not sure I would have believed you,” Army Commander Lieutenant-General Wayne Eyre admitted.

While measures were quickly taken to protect and preserve the Force for a possible response, in those early days national and international health authorities were struggling to understand the scope of what they were facing. How the virus was transmitted, who was most at risk, and what treatments were available were among the “many unknowns,” said Coker, whose first task was to prepare general information on COVID-19 for military and civilian personnel, a document that

has since evolved into a mandatory general COVID awareness course for all Department of National Defence personnel.

More than 24,000 Regular and Reserve Force members and Canadian Rangers were mobilized. The Army established regional task forces, some at physical locations such as Canadian Forces Base Borden, Ont., others in virtual settings, but all prepared to act. The Army even brought 8,000 Reservists onto full-time service, the “largest activation of our part-time Reserves onto full-time service since the beginning of the Second World War,” said Eyre.

Risk And Resumption

When Coker arrived at Army headquarters, many of the steps to protect the force and prevent clusters of outbreaks were already in place. Much of the training system and professional development was on pause, garrisons had slowed to essential activity, and headquarters staff across the country were working from home where possible and relying on new online tools to command and communicate. The conversation was

now turning to when and under what conditions the Army could resume force generation.

Much like federal, provincial and municipal health authorities advising their governments on how and when to restart their economies, Coker’s initial briefings to Eyre and the Command Team focused on public health risk reduction principles, developing testing technologies and their limitations, and how such technologies might be prioritized.

Internal testing capacity was almost non-existent at the time, but as it became available, could it be combined with quarantine before a resumption of training? “And what was the risk if we can’t do the ideal solution? How do we plan for a positive case in a training environment? How do we ensure everyone is doing daily health checks of symptoms? On courses and exercises, how do you feed everyone? How should you set up ablutions? Sleeping quarters? There was a menu of questions we had to answer to help reduce risk.”

The Army underscored any return to training would be asymmetrical and asynchronous, beginning only as conditions in each province and





Cpl Stephanie Patz from 12 Field Ambulance in Vancouver flies in a CH-149 Cormorant to Victoria Airport before heading to Quebec for deployment on Op Laser.
Photo: Pte Daniel Pereira

region permitted. The paramount objective was to prevent spread within the Force itself and out to the wider community, especially in regions where health resources were limited or already stretched.

“If you are on a base where there are lots of single rooms, single bathrooms, that gives you flexibility to quarantine people,” said Coker. “That is the approach (5th Canadian Division Support Base) Gaagetown was able to use. And that was the approach I was recommending. They restarted gradually, with one or two courses, and then they ramped up slowly, making sure to share any lessons learned with the greater Army and CAF.”

Where bases lacked the infrastructure to quarantine in place, the options included a period of quarantine at home, keeping courses and training units to smaller “cohorts” that could be monitored and kept on base for the duration of the training.

As units began briefing the Canadian Army Doctrine and Training Centre about their local circumstances, division and brigade surgeons were able to weigh in with options. “I did say, ‘there will be cases, the important thing is to have well established procedures and protocols to deal with them when they happen,’” said Coker.

Learning quickly from any issues that arose from the restart was a priority. Above all, though, were leadership and continuous communication. “That is what the Army is good at, providing junior leaders

information to reinforce what needs to be done,” he said. “What I tried to do was provide the principles, and then the local circumstances have to come into play to develop the plan, and then that plan needs to be assessed for its risks – assuming said risk is a command decision.”

Collective Questions

When force generation resumed, Eyre put a priority on individual training. By late summer, entry-level and basic qualification courses, leadership programs and primary combat functions were well underway. Now the discussion is centred on how to safely conduct the collective live exercises essential to bringing together headquarters, combat teams and critical enablers.

As with individual courses, the same guiding principles for protecting the force apply. But Coker is also assessing additional questions. Will an exercise involve visiting military? And what are the parameters for integrating them? Can the limited testing capacity be used to target test groups that aren’t able to quarantine for a duration? Is there capacity at an exercise to isolate those who come into contact with someone with COVID until testing can confirm their status?

“One of the key principles I’m pushing is early coordination with division and local medical advisors – the division, brigade and base

surgeons and the medical planners – so we can appropriately estimate what level of medical support is available to an exercise concept and then develop a plan in a realistic way. We can’t have zero risk, so the philosophy is, we are going to take as many precautions as we can so we can keep going with our mission of force generation.”

He’s also warning commanders not to become fixated on the coronavirus at the expense of other health issues such as cold and heat that can cause injury in training environments.

The lessons from the Army’s deployment into long-term care facilities are still being gathered and shared and will eventually inform an updated CONPLAN for pandemic response.

“Troops embraced the task and I am very proud of the job they did,” added Eyre. “Working with Health Services, they saved lives.”

But there is little question the pandemic has had a significant impact on force generation, and the lessons from that are being distilled and implemented immediately. “If there is a takeaway, it is that we can’t afford to shut down our personnel production pipeline like we did,” said Eyre. “Now we are much more comfortable operating in an active COVID environment. And going forward, it would have to be pretty significant before we would shut down training again.” ■



Members from 4th Battalion, Royal 22^e Régiment, provided assistance at the Villa Val Des Arbres long term care centre in Verdun, Que.
 Photo: Cpl Genevieve Beaulieu

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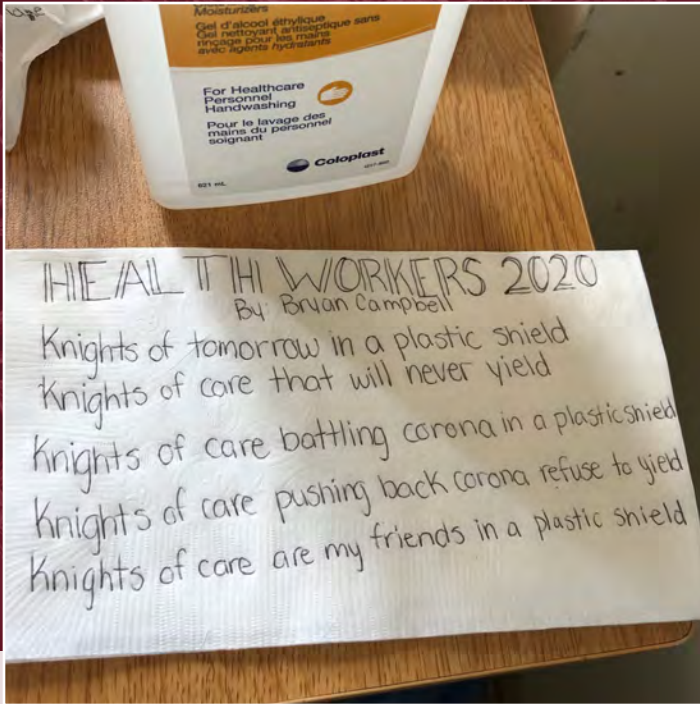
Teams of military personnel from across the country provided care to residents of long-term care homes, including at the Vigi Reine-Élizabeth residential centre in Montreal.
Photo: Cpl Genevieve Beaulieu

INTO THE BREACH

By Ian Coutts

When the COVID-19 pandemic hit Canada in March 2020, it was obvious that the country faced an almost unprecedented emergency. Long-term care homes, housing some of our most vulnerable Canadians – the elderly and permanently disabled – were particularly hard hit. Provincial governments in Ontario and Quebec requested help from the federal Minister of Public Safety. To help in these facilities the Canadian Armed Forces provided medical personnel, backed up by Regular and Reserve Force members from units across the two provinces. These are the stories of some of the Reservists from Ontario.





A poem dictated by Hawthorne Place resident Bryan Campbell for all visitors to the home. Photo: Shelby Barton



At Blackdown Cadet Training Centre at CFB Borden, members trained putting on and removing personal protective equipment. Photo: Cpl Stuart Evans

Major William Bowes, Royal Hamilton Light Infantry. A former Regular Force Army Officer, he served as Officer Commanding (OC) 1 Domestic Response Company (DRC), Territorial Battle Group (TBG) 1: “It was around mid-March that I heard that it could happen. I was hearing rumours about what the federal response looked like. I don’t think I got confirmation until late March.”

Corporal Wolf-Peter Marty is a member of the 1st Hussars, from Sarnia, Ontario, who also served with TBG 1: “At the time there weren’t really any details other than that names were being gathered for interest in preparation for a possible domestic operation.”

Master Corporal Jason Laughlin, 1st Hussars, London, Ontario: “I was on a short-term contract when I heard about the opportunity to do something, and I went for that.”

Bowes: “I deployed to Canadian Forces Base (CFB) Borden as part of the Territorial Battle Group advance party. I was there a couple of days before the battle group. That was the first few days in April. Myself, the Sergeant Major and the other OCs, organizing what it would look like and how the training would run, and getting everybody together.”

Marty: “We ended up getting official word regarding who was being deployed as a part of Op Laser on April 5, and some key individuals within my unit did an absolutely amazing job of managing to organize and stand up a full armoured reconnaissance troop with such speed that we were in Blackdown (a training area of CFB Borden) with fully equipped vehicles by the next evening.”

Even as the Reservists arrived at CFB Borden in early April, it wasn’t clear what type of domestic operation they might deploy on, though from there they would be sequestered and centrally repositioned, ready to support taskings received from the government in response to COVID-19 or other emergencies.

Corporal Kyle Gary Burch is a member of the Royal Hamilton Light Infantry: “We were deployed to CFB Borden and housed in the Blackdown component, which is traditionally a cadet summer training camp. But it had all the facilities, and they were large enough they could instruct us while maintaining social distancing.

Bowes: “It’s concrete pads with canvas walled tents. Smallish beds but not uncomfortable.”

Members from different units were grouped together into new platoons and companies, based on the brigades their home units were part of.

Lieutenant Sarah Dawkins is a member of the Cameron Highlanders of Ottawa. She commanded 2 Platoon in the 3 DRC: “I’m an Infanteer by trade but most of my platoon were Armoured. They were from Oshawa, The Ontario Regiment. My Warrant Officer was from the Second Irish in Sudbury [2nd Battalion, Irish Regiment of Canada]. We had one Artillery member and a few Cameron Highlanders and Governor General’s Foot Guards from Ottawa as well.”

Burch: “All the different units, it’s nothing new for us. We’ve all been on courses together, joint training together. I’d catch up with soldiers I hadn’t seen in three, four years and we’d continue our conversations like it was yesterday.”



MCpl Jason Laughlin with resident Bass Thiruganawan and Cpl Wolf-Peter Marty.
Photo: Shelby Barton



MCpl Jason Laughlin and Cpl Wolf-Peter Marty with resident Bryan Campbell.
Photo Shelby Barton

What they would be responding to was still uncertain, so they trained for a number of scenarios.

Dawkins: “The training was tough at first. We weren’t sure if we were going to help with floods or COVID.”

Burch: “We did standard training. Sandbagging, evacuations, assisting local law enforcement, some training on Rigid-Hull Inflatable Boats (RHIB), in case there was a natural disaster.”

Dawkins: “We also did the pandemic side; donning and doffing of PPE (personal protective equipment), what is the correct way to wash hands, what is the correct way to stay healthy. Social distancing.”

Bowes: “Our training evolved as our awareness of the response did. It was very fluid.”

In late April, the Reservists began to deploy into the first five of what would eventually be seven long-term care facilities in the Greater Toronto Area. 1 DRC was given responsibility for three homes: Holland Christian Homes Grace Manor, Eatonville and Hawthorne Place. As part of 3 DRC, Sarah Dawkins’s platoon was to cover Downsview Long-term Care Facility, starting in late June.

Bowes: “I have never experienced a military operation that moved as fast or as urgently as we did. From learning that we were going to respond, to actually having soldiers inside, was a matter of a couple of days.”

Laughlin: “When we deployed, we were the first ones to go in. It took a couple of days to really set in stone what we were supposed to do.”

Burch: “We had Tyvek suits, one-piece jumpsuits, our face masks, more than

enough gloves and an endless supply of hand sanitizer. We were changing out our suits and gloves and mask constantly.

Burch: “We had three sections. One stayed back at the hotel. They were the unsung heroes. They deserved a lot more of the credit. Without them we wouldn’t have been able to function; they made sure the elevators were sanitized (after use), that hot meals were brought to us. They also provided us with laundry services or anything else to ensure we were comfortable.”

Laughlin: “How it worked: We had our little teams; two support staff and two medical staff on a floor with a third, a senior nurse, who floated between the second and third floors. After a while, we decided to stay on a floor.”

Marty: “Even just the little things made a big difference. For example, the medics quickly came up with the idea of writing our names at the top of our face shields with a sharpie so that the residents could more easily identify and start to recognize us. Well, thanks to us combat arms folks, that of course quickly progressed to also writing our names on our disposable Tyvek suits, then incorporating smiley faces into the letters, then eventually doodling other fun things like a flower or a tie to help cheer people up.”

Deploying to work in and around patients suffering with COVID-19 meant not just being away from home, but that there was always a chance they, too, might be infected.

Dawkins: “I was never personally concerned. If I had to go home to my family every day, I’d probably have been a little bit more.”

Burch: “My mother’s always been the concerned type, so she did have her doubts. But overall, my family thought it was right. It was tough on the kids, [his sons, Hunter, four, and Damon, one], they didn’t quite understand, but I kept in touch with them.”



Avr Gram Smienk, medical technician with 2 Field Ambulance, speaks with a resident of Saint Andrew Residential Centre in Montreal in May. Photo: Avr Zamir Muminar



Members from 2nd Field Regiment don PPE at the Argyle long-term care center in Saint-Lambert, Que. Photo: Cpl Genevieve Beaulieu

Laughlin: “At the start I remember walking into a bedroom for the first time that had a sign on the door saying that the person in the room was infected... and I remember walking in and I just dreaded it. But as time went on, I got more and more used to it.”

Marty: “It was definitely hardest on my fiancée, who just four months prior had moved from Victoria, B.C. to live with me and start our life together in Sarnia. Luckily for me, she’s an amazing woman and an incredibly supportive partner.”

Working with the patients, they soon began to make friends.

Marty: “The best part of the whole experience was getting to know the residents, their stories and personalities.”

Laughlin: “Definitely some really neat characters. I have to make sure Bryan Campbell gets mentioned. He wrote poems for us. He always loved to talk to us and would ask us to ramble about our jobs. And I have to mention Dorothy, she was really cool. She actually used to work for the United Nations, even grew up in Africa. It was just neat to listen to her talk. She cried when we left, and it made me feel really bad. Bass really struggled to talk, but me and Corporal Marty loved to talk to him. Eventually we kind of became the translators for him. We called it ‘Talk Bass’.”

Marty: “He was such a mischievous troublemaker who delighted in trying to stir the pot and mess with people, but it took us a while to figure that out because of a fairly significant language barrier. Once we got to know him though, it brought smiles to our faces to see him every day.”

Burch, who was working at Holland Christian Homes Grace Manor, where many residents were Dutch: “Probably the most memorable thing was May 5. The Dutch celebrate that as Liberation Day. They had a small parade, if you will. The owner, the Mayor and a lot of residents were there for a flag-raising ceremony with the Dutch flag and the Canadian flag. I was one of the soldiers selected to raise the Canadian flag. It was a fantastic ceremony. I think that made a lot of the soldiers feel really good about themselves.”

By early June, as the wave of the pandemic began to ease, the Reservists began to withdraw from the long-term care facilities. In all, more than 500 CAF members had worked in the seven facilities in the GTA.

Dawkins: “I got promoted to Lieutenant on this operation. It was my first time in a leadership role. I learned so much about my skills and how I wanted to develop my subordinates.”

Burch: “I think a lot of us learned to be a lot more patient and compassionate.”

Laughlin: “It affected me personally. In our long-term care facility, there were people who just couldn’t take care of themselves. It gave me a whole new perspective ... I want to start volunteering for work related to that.”

Bowes: “There were days when everything was going so quickly, where I lost sleep trying to adapt to things, but the soldiers I had did such an exceptional job that I felt comfortable putting my trust in them. They had such a positive attitude and they did such an incredible job.”

Dawkins: “My platoon was itching to get out there. It shows the power of the Reserves. All these members have civilian lives and they all come together in these times.” ■



MCpl Jason Laughlin



Members from 1 Canadian Field Hospital, Detachment Halifax arrive in a CC-130J Hercules at Saint-Hubert Garrison in Montreal on May 9. Photo: Cpl Laurian Ene



Members of 1 Territorial Battle Group pose with Ken Rawlins, CEO of Holland Christian Homes, and members of 4 Canadian Forces Health Services Group. Photo: Cpl Justin Dreimanis



The Canadian Ranger Patrol in Pond Inlet assembles for orders in April. Photo: DND

Rangers Tackle Novel Tasks

By Allan Joyner

In the early days of the novel coronavirus pandemic, the Hamlet of Igloolik, Nunavut faced a potential food crisis. Though the full extent of COVID-19 was still unknown, the community feared food distribution could become a critical problem if people were confined to their homes. With funds from various levels of government, Igloolik purchased groceries from two local businesses and soon filled the local gymnasium with meat, fresh vegetables, fruit, and other staples.

The community then turned to members from the Igloolik Canadian Ranger Patrol of the 1st Canadian Ranger Patrol Group (1 CRPG) to manage the distribution of the much-needed food to every household. They also distributed Arctic char, caribou and seal meat donated by the Igloolik Hunters and Trappers Association.

The 1 CRPG effort was part of Operation Laser, the Canadian Armed Forces (CAF) response to COVID-19. 1 CRPG operates 60 individual patrols in and around 64 communities across Nunavut, the Northwest Territories and Yukon; it also has one patrol in Atlin, in northern British Columbia. Each patrol is composed of local residents with in-depth knowledge of their people and communities, and the land that surrounds them.

On April 2, shortly after Op Laser was initiated, Brigadier-General Patrick Carpentier, Commander Joint Task Force (North), sent a letter to community and territorial leaders notifying them that consenting Rangers from 1 CRPG were activated across the North to provide practical assistance to challenges presented during the crisis, and to instill community confidence.

The list of tasks, to be performed on an as-required basis, included wellness checks and assistance verifying and supporting at-risk individuals and families, assistance with the monitoring of critical infrastructure, transport and distribution of local supplies, support to local and community and territorial COVID-19 awareness programs, assistance loading, transporting and unloading of humanitarian assistance goods relate to the crisis, and

assistance to local health authorities.

The response was in many ways a novel use of the Rangers. Actions in Igloolik and other communities across the North are not typical of the duties the patrols undertake. Many Canadians associate the Rangers with patrols over the snow-covered land of the treeless Arctic. Most don't realize that Ranger units are also formed in all three territories and all seven provinces that contain or border northern areas. Those overland and ice-covered sea patrols are a critical part of 1 CRPG's duties, but this year their roles also entail invaluable community support.

"Op Laser was very different for us, and not necessarily a model that would extend to any other situation," said Lieutenant-Colonel Raymond Chiasson, commanding officer of 1 CRPG.

A patrol in Tuktoyaktuk, for example, distributed supplies students had left behind when schools closed in March, so they could study from home. The patrol also distributed much-needed groceries.

In Watson Lake, YT, the local 1 CRPG prepared and delivered food hampers in support of a Hearts and Hands community project. As in the rest of Canada, COVID-19 made it difficult for some vulnerable members of the community to access stores. The Watson Lake response fundraised for and then distributed cooked meals and groceries.

"The residents who join the Rangers are often some of the most capable and civic-minded people in their community," said Chiasson. "With their training, organization, and mobility, they play a vital role in many of the communities.

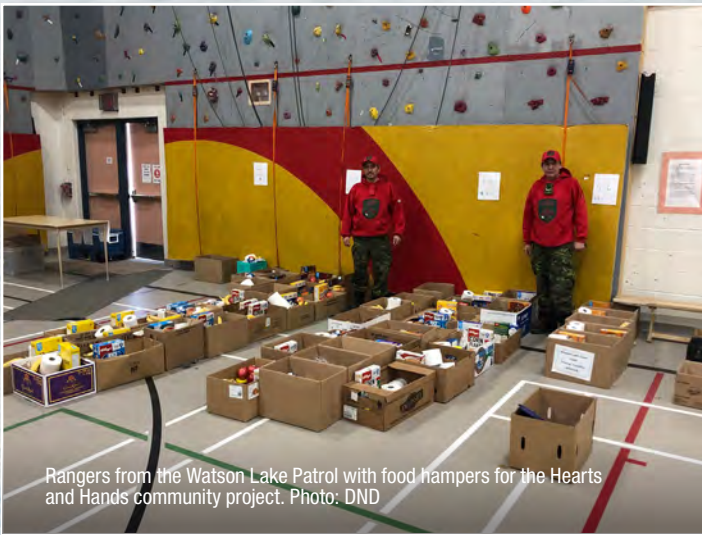
"Fortunately, so far COVID has been very rare in the North," he added. "The Canadian Rangers activities certainly contributed to a lot of peace of mind. Many community agencies have small staffs at the best of times and the importance of having this added resource to help out if anything serious occurs cannot be overstated." ■



Ranger Moses Iqqaqsaq on a skidoo towing a Qumatik, delivering food to families in Igloolik. Photo: DND



Rangers Dan Flanagan and Jimmy Wolftail pack 120 meals for distribution in Watson Lake. Photo: DND



Rangers from the Watson Lake Patrol with food hampers for the Hearts and Hands community project. Photo: DND



In Tuktoyaktuk, Rangers Darrel Nasogaluak and Eva Panaktolak load packages for delivery. Photo: DND

Never More Prepared

As soldiers across Ontario mobilized to confront a pandemic, Grey and Simcoe Foresters prepared in isolation for a worst-case scenario.

By Lt(N) Andrew McLaughlin

In mid-March, 31 Canadian Brigade Group's Grey and Simcoe Foresters (G&SF) had just wrapped up a successful training exercise in the near North, confirming that the 4th Canadian Division Arctic Response Company Group (ARCG) – the Foresters' mission task assigned directly by the commander of the Canadian Army – remained ready to respond to help Canadians in the most hostile environments.

Unbeknownst at the time, that exercise had uniquely prepared them for the real thing.

Just days later, on Apr. 6, the call came to move out. The ARCG would play a role in Joint Task Force Central's (JTFC) rapid deployment to Canadian Forces Base Borden, close to the unit's headquarters in Barrie, Ont., where a Territorial Battle Group was stood up consisting of soldiers from across Ontario. Just as practiced mere weeks

earlier on NOREX 20 – a test of the ARCG's ability to deploy, communicate, move and operate in harsh environments and challenging terrain – the troops would move out rapidly and provide the commander of JTFC with unique capabilities and experienced, professional soldiers.

"We were absolutely primed to go," said Lieutenant-Colonel David Meehan, commanding officer of the G&SF. "Rarely do we have the opportunity to prepare for a major domestic operation like we did when we deployed [on NOREX] in February and March."

The short respite from the high-intensity operations of the northern exercise provided just enough time for the ARCG to reconstitute in Barrie and reset for another mission. In early April, JTFC deployed approximately 500 Canadian Armed Forces (CAF) members to Borden, ensuring a force

was ready to support Operation Laser, the CAF's contribution in the government response fighting COVID-19.

The ARCG would play a vital role in that organization, preparing to respond to emergencies to the north, while the rest of the force could focus on less isolated communities. "Not only did we have to organize and deploy our forces," said Master Warrant Officer Jordan Webb, Company Sergeant Major, "but we had to do so while taking extraordinary precautions to protect our members, and therefore the communities they might be called on to help."

This included isolating the entire ARCG of over 100 soldiers, and tailoring training to meet specific force health protection measures like reducing the capacity of vehicles and instituting distancing protocols. "The measures we took added



MCpl Rebecca Craddock and Cpl Dustin Tanner analyze a sand table during training for the Arctic Response Company Group. Photo: Cpl Cody Misner

challenges to the training for sure, but we were able to execute," he said.

The ARCG is made up primarily of Reservists, and they were activated on a volunteer basis after March 30. "We had an outstanding response from our members," said Meehan. "We filled our positions very quickly, as members from the G&SF and across 31 CBG stepped up to serve on short notice."

From Borden, JTFC members deployed into seven long-term care facilities (LTCF) in the Greater Toronto Area, as requested by the Ontario government. But behind the scenes, the ARCG spent months isolated as a unit, and fully engaged in theatre-specific training, maintaining the capacity to respond rapidly if required.

"Readiness and resilience are two essential qualities for a healthy, fit soldier who is ready to perform on operations," said Webb. So, physical fitness was enforced, and mandatory section-level PT added to what became a routine of constant drills and exercises testing the unit's mobility and readiness while they waited for an order to move.

"We wanted to keep the troops busy, as boredom can set in during long staging periods like this," said Webb. That meant organizing a litany of training evolutions, from land navigation, to first aid and survival scenarios, to ATV and chainsaw courses complete with full qualification to CAF standard for those successful upon completion. They even ran a pre-PLQ course for senior corporals to prepare them for the courses they



had applied to before COVID-19 put a halt to all Reserve summer training.

"Many of our soldiers ended up gaining a bunch of new quals during the deployment," said Webb. "Not only did the constant training benefit the mission, it benefitted the individual soldiers as well."

Specialized training like ATV courses and LOSV (Light Over Snow Vehicle, or snowmobile) are cornerstones of regular ARCG operations, but they

are also highly sought-after courses for Army soldiers. The ARCG's primary role as a mobile response force requires each member to undergo a series of qualifications, like Winter Warfare—Basic, to prepare for harsh conditions in the unforgiving North.

"Our members possess unique military knowledge and skills, which positions them well to assist civil authorities in specialized areas during emergencies in isolated communities," said Meehan. "It's a testament to these soldiers' dedication to that mission to see so many of them volunteer, pack their kit, and leave their jobs and families on short notice. I couldn't have been more proud of them, and the ARCG came back stronger than ever because of it."

In the end, the worst-case-scenario didn't materialize. The ARCG didn't receive a deployment order or even leave their isolated camp at CFB Borden. But their time there was well spent, according to Meehan.

"Whether its deploying to the High Arctic or isolated Northern communities on NOREX, training on evenings in Barrie, Owen Sound and across Southwestern Ontario, or running individual training to qualify soldiers in specialized skills and equipment, we're ready to go, whenever that call comes next." ■

Lieutenant (N) Andrew McLaughlin is the public affairs officer for 31 Canadian Brigade Group.



MWO Jordan Webb steers through the mud on an ATV as part of the Grey and Simcoe Foresters' training regime. Photo: Cpl Cody Misner



1 Service Battalion resumed training with Exercise Rough Rider in September at the Wainwright, Alta., training area. Photo: Cpl Djalma Vuong-De Ramos



TRAINING IN A PANDEMIC

As the training system ramps back up after a four month pause, restoring readiness and building resiliency are at the forefront for the commander of CADTC.

BY CHRIS THATCHER

If 14 months in the Middle East reinforced anything for Major-General Michel-Henri St-Louis, it's the need for resiliency. As the commander of Joint Task Force-Impact, headquartered in Kuwait and responsible for the personnel on Operation Impact in Iraq, Jordan and Lebanon, he led a capacity building mission buffeted by civil unrest in Iraq, fire exchanges between the United States and Iran, including an Iranian ballistic missile attack, and a global pandemic.

The mission was a constant reminder of the best the Canadian Armed Forces can bring. But it was also battered by what he called the perpetual presence of black swans, events that stressed the joint force and challenged Army readiness.

In such a constant state of uncertainty, St-Louis found his mind drifting back to an experience 30 years ago as an officer cadet on the basic paratroop course when an instructor moved the goal posts at the end of an intense run, leaving the cadets with an unknown distance still to complete.

"There was no question you were not going to fall out. You had to succeed,

you were going to finish, but now you had this broadened element of uncertainty," he recalled. "I kept thinking back to that run at times when we were rocketed in Iraq or had to adjust the joint force to a changing threat."

St-Louis is the incoming commander of the Canadian Army Doctrine and Training Centre (CADTC), a position he assumed in a socially distant ceremony in August. Though he's still settling in, recent operational experience has reinvigorated his thinking around the need to ensure training prepares soldiers for the unexpected and the ability to withstand uncertainty.

How to achieve that is a conversation he's just begun with his command team, but the aim is to develop individuals and units that are "physically able to excel at their tasks [and] dominate on the battlespace," but also have the mental and psychological capability to "accept a changing environment, an enemy throwing a different threat at you that maybe you had not foreseen, or an unexpected turn of events. That mental or psychological resiliency, that team cohesion, based on a solid footing of physical fitness, knowledge and technical ability – that is what I'm getting after.



Members of Bravo Company, 1st Battalion, The Royal Canadian, conduct grenade range training. Photo: DND

“Sometimes we focus on our technical ability or our physical fitness to the detriment of our mental capacity to withstand change and uncertainty,” he explained. “I am looking at making it a whole, where you are able to withstand that adversity and continue to thrive.”

Much of what he needs already resides in the training system. The Canadian Armed Forces contingency plan for a pandemic, Operation Laser, imagined many things, but it did not include the deployment of soldiers into hospitals and long-term care facilities. Still, the skills to tackle the unusual request from the governments of Quebec and Ontario were resident in the training of many Regular and Reserve soldiers.

St-Louis pointed to the approach of a battalion commander with 5 Canadian Mechanized Brigade Group as he divvied up responsibilities among his platoons in Quebec. “The way he went about his business was exactly the way he had been trained to do all his professional life. The fact that their responsibility was to help in a long-term care facility compared to a village in Panjwai where there was active enemy only changed the environment.”

In fact, the capacity building that comprises most Canadian Armed Forces missions provides a solid foundation for domestic operations and the uncertainty that can emerge when working with local populations in unusual

circumstances. It’s territory St-Louis knows well. An infantry officer with the Royal 22^e Régiment, he has deployed on six missions to the Balkans, Afghanistan and the Middle East that involved some aspect of capacity building.

The current system produces well-trained and adaptable young leaders, he insisted. “I have seen them in combat, on training missions. The way we produce master corporals, sergeants, lieutenants and captains already gives us a number of skillsets that make us great instructors, good combat arms soldiers. But I do believe there is a special approach and a special skillset when you are doing capacity building, when you are doing transfer of knowledge to another army, and you are going there with a clear strategic intent to make them better.

“When you actually look at the output of what we are able to do with, for example, a team of Reservists from central Canada that come to Lebanon to give combat first aid training to a generation of Lebanese soldiers and officers without specific coaching experience, but with their training and professional development, it’s an amazing effect. Our Canadian perspective, our duality of language, who we are as Canadians, puts us in a great position to do that well in comparison to some other countries.”



Members of 1 Service Battalion, having isolated in their cohorts for a period exceeding 14 days without exhibiting COVID-19 symptoms, conduct exercise Rough Rider in September in Wainwright, Alta. Photo: Cpl Djalma Vuong-De Ramos

LOST READINESS

St-Louis is taking command of the Army's training system as it repairs a break in its production pipeline caused by COVID-19. If the Army is normally in a constant state of generating readiness, conducting individual training, collective exercises and professional development courses to prepare soldiers for deployment, much of that took a hit between mid-March and the end of June.

"Certain activities continued during that time," St-Louis noted, including training for rotations of troops to Iraq, Latvia and Ukraine, "but now we have to fill the gap that was caused by that pause."

"What we lost was ... readiness," Army Commander Lieutenant-General Wayne Eyre explained in a recent interview. "We ceased all of our collective training, and based on shutting that ... and reduced capacity over the summer, we lost somewhere in the neighborhood of 4,000 qualifications, about 1,000 of which were leadership qualifications. That is going to take a while to catch up."

Eyre has prioritized individual over collective training for the next months, "understanding we still have to do some collective training to maintain that level of proficiency for readiness, for deploying troops overseas."

That has meant a phased approach that is both asymmetric and

asynchronous. Training centres have attempted to resume entry-level training and basic qualification courses, leadership training, and primary combat functions while adapting to provincial health guidelines that vary from province to province, and even within regions of a province.

At 5th Canadian Division Support Base Gagetown, N.B., soldiers have been able to quarantine in base accommodations for 14 days before starting courses at the Combat Training Centre. Other centres from the Royal Canadian Electrical and Mechanical Engineers School in Borden, Ont., to Canadian Forces School of Communications and Electronics in Kingston, Ont., and Army's Advanced Warfare Centre in Trenton, Ont., have adopted mitigation measures, including training bubbles to limit spread between cohorts and widespread use of protective equipment, physical distancing and proper hygiene.

In August, courses resumed at the Canadian Army Command and Staff College, starting with the Reserve Army Operations Course (AOC) preparing captains for headquarters staff roles. It, too, adopted a "very controlled training bubble, supported by a synthetic simulation environment," St-Louis said. "That was a great success. It did not result in any additional COVID cases or problems."

More recently, the Regular Force AOC, which had paused in March, brought



MGen Michel-Henri St-Louis, commander of CADTC, on the rifle range during C-7 weapons qualification in Kingston, Ont., this October. Photo: MCpl Rod Doucet

captains back to Kingston to finish their course. “After it’s conducted, we will harvest lessons and adjust the delivery if necessary”, St-Louis said of future programming.

By early August, Reserve units were conducting basic military qualification in a distributed manner. Surprisingly, two Divisions, “despite starting two months later, produced more individual [Reserve] qualifications than they did the previous year,” said Eyre. “Part of this is the economy and troops are more available. We had them on Class C contracts so they were a captive audience. [But] we are currently analyzing ... that to see what worked and why.”

COLLECTIVE SIMULATION

The return to collective exercises, however, will be more nuanced. The Combat Team Commander course in Gagetown, for example, has in recent years culminated in Exercise Common Ground, a large-scale manoeuvre of armour, artillery, infantry, and service support. The exercise has also included students from the Company Sergeant Major Course, Squadron Sergeant Major Course, Advanced Sniper Course, Infantry Officer Course and Advanced Reconnaissance Patrolman Course, among others.

“This year those training repetitions will be done on the backbone of our

simulation architecture,” said St-Louis. “This is a crucial course for majors that need to be ready to command subunits, teams of 100 to 150 soldiers in the battlespace. [Now] they will be dispersed, connected and leveraging technology to get the qualification.”

Some exercises like Unified Resolve already make good use of simulation and dispersed participation, but that approach will now apply to many others, including Maple Resolve, the Army’s largest and most complex live exercise and a critical marker on the road to high readiness.

“We are planning to conduct a Maple Resolve, physically, in an adapted and adjusted way,” he said. While one or more battle groups will manoeuvre across the training area in Wainwright, Alta., other units will likely connect and exercise virtually.

“By canceling Maple Resolve last year, we have lost some proficiency at the brigade level. This is a risk we are assuming eyes wide open,” added Eyre. “We are going to be making up that shortfall over the course of the next few years. One of the things I am very keen on is additional simulation — increasing the use of simulation, and the mixture of live and simulated environments.”

Both Eyre and St-Louis acknowledged the limitations of a simulated environment to generate the friction found in live exercises, where soldiers

battle through annoying and complex problems and build resiliency in the process. “While I’m a fan of simulation, it by no means replaces field work,” said Eyre. “What it does do is give you more sets and reps, so that when you go to the field, it is a higher quality experience.”

More than anything, COVID-19 might force wider acceptance of blended live, virtual and constructive training, fast-tracking the development of the networks connecting Regular and Reserve units and training centres and the adoption of CADTC’s recently launched Future Integrated Training Environment concept.

“There can be no more resistance to change or technology. We need to embrace it,” said St-Louis, who is still getting up to speed on a planned Virtual Training and Experimental Network (VTEN) that will eventually connect training infrastructure. “[The pandemic] might be an impetus to rely more on technology, connectivity and simulation ... to still achieve [training] objectives. One of the things I am looking at from this chair: Do we have the ability to connect in all these training events?”

“I think we will become even more comfortable doing things simulated and dispersed ... [but] at present none of that is seamless across every level.”

The interoperability of networks will be a key talking point as the Army looks at Regular and Reserve Force participation in exercises with allies, especially the U.S. Army and National Guard. The training plan for the next 12 months still includes exercises like the Joint Warfighting Assessment series, but St-Louis is preparing “two courses of action” just in case: one if units are able to travel and one if they must connect remotely.

Whether training is conducted in Canada or elsewhere, the Army will be leaning more heavily on the Canadian Army Simulation Centre for the design, development and delivery of computer-generated and -supported events. “They have become that much more important and critical to our generation of readiness,” he said.

READINESS OBSESSED

Before assuming command of JTF-Impact in 2019, St-Louis served for two years as the deputy commanding general for operations of U.S. Army I Corps at Joint Base Lewis-McChord, WA. Comparing American and Canadian training systems and doctrine can quickly get lost in the difference in scale of the two armies. And St-Louis sees little difference between Canadian “world-class young leaders” and the “U.S. Army troops I had the fortune to serve with.”

But he is bringing to CADTC one lesson he absorbed early on at I Corps: “An absolute obsession on readiness.

“There is a very clear realization in the U.S. Army that they need to be ready to face whatever threat is coming,” he explained. “There is a laser focus on having an army that is ready, from the individual soldier to the formed units, to respond to the call. I’m bringing that as an element that animates this command I’ve inherited. It’s an amazing opportunity to be part of the doctrine and training system where we generate some of that readiness.” ■



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BGen Gervais Carpentier addresses 2nd Canadian Division troops. The Division's road to readiness is underway, but with measures in place to manage a pandemic. Photo: DND



The Road to High Readiness Less Travelled

After a lengthy pause in its training schedule and still dealing with a pandemic and adapting to changes in the Army's Managed Readiness Plan, 2nd Canadian Division will follow a road to readiness notably different from previous years.

By Chris Thatcher

Confronting and overcoming obstacles is a common occurrence on the road to high readiness. In fact, the friction generated throughout training exercises is often deliberate and intended to confirm the combat effectiveness of soldiers for global deployment.

In July 2021, the Regular and Reserve Force members of 2nd Canadian Division (2 Cdn Div) will assume responsibility as the Army's high readiness force, prepared to complete rotations in Iraq, Ukraine, Latvia and elsewhere, and to react to domestic requests for assistance.

To get there, however, the Division will navigate a road unlike any of its recent predecessors. Key training events will still provide the units the necessary qualifications to validate their readiness to deploy, but sections of their road could be more virtual than live as they adapt to restrictions imposed by the COVID-19 pandemic.

"The pandemic requires that the tools to conduct our training be adapted to the situation," said Brigadier-General Gervais Carpentier.

Carpentier assumed command of 2 Cdn Div and Joint Task Force East in August 2019 and understands the training rhythm of the Division as well as anyone. A member of the Royal 22^e Régiment, he commanded the 3rd Battalion's parachute company, the 2nd Battalion, and served as Chief of Staff at 5 Canadian Mechanized Brigade Group (5 CMBG) and most recently as

Commandant of the Royal Military College Saint-Jean. He also commanded a Canadian Special Operations Forces Command attack squadron and deployed on missions in Croatia, Bosnia and Herzegovina, Haiti and Afghanistan twice.

As with everything else that has already happened in 2020, the road to high readiness will look different, he acknowledged. The training sequences and objectives remain the same, but “the way the training activities are delivered” will require some out-of-the-box thinking.

The Division has already proved itself capable of adjusting on the fly. In April, when the Quebec government issued an urgent and unusual call for assistance, around 1,500 of its Regular and Reserve Force members, including Canadian Forces Health Services personnel, were deployed into 47 long-term care facilities across the province under Operation Laser.

Carpentier attributed the success of that mission to a structure and capability resident in the Division’s Immediate Response Unit and Territorial Battle Group, under the command of 5 CMBG. In 2017 and again in 2019, that structure facilitated the deployment of 2,900 and 1,500 troops, respectively, to assist the province with flood relief efforts under Operation Lentus.

“Our foundation training and individual training prepares us well for what needs to be done domestically, and it speaks to the importance of keeping that individual training going,” he said.

Like the rest of the Army, 2 Cdn Div experienced an almost four-month pause to most of its training regime. Restarting the “individual training (IT) machine” was critical, he said. However, while technical qualification and leadership courses have resumed and Regular and Reserve Force units

are conducting individual training, the collective exercises in Valcartier and elsewhere, including the United States, that usually define the fall schedule are being reassessed.

Carpentier said a brigade Level 6 computer-assisted exercise was planned for the late fall, and 5 CMBG’s winter warfare exercise, Rafale Blanche, will go ahead, albeit with more virtual elements. But the big changes could come in the New Year.

The participation of a company in the U.S.-led Joint Warfighter Assessment series, originally planned for spring 2020 in Germany, may now become a virtual event if travel remains restricted. “We’ll be taking part soon in the initial planning conference, but we’re looking at being part of it from a remote location in Quebec,” he said.

Unified Resolve, the Army’s premier computer-assisted training event for the brigade headquarters preparing for deployment, will be even more dispersed than previous years. The exercise is “a key training event for 5 Brigade,” he noted, and could involve large-scale movement of formations in Valcartier and elsewhere in Quebec, interacting with simulated formations, rather than a static headquarters responding to realistic but simulated scenarios designed to test its command and control capabilities.

The Division has capitalized on a number of online tools to conduct courses remotely and to exercise command and control of deployed units in long-term care facilities and respond to three separate requests for the assistance of Canadian Rangers in northern communities. Some of those could come in to play to facilitate exercises, Carpentier suggested. “Our leaders will continue to



Members of 34 and 35 Canadian Brigade Groups resumed Reserve junior leadership courses at CFB Valcartier in August. Photo: Cpl Georgia Tsotas



Members of 5 Combat Engineer Regiment install a charge to breach a door. Photo: Cpl Genevieve Beaulieu

be innovative in how we use technology.”

One of his challenges could be integrating Reserve units into Regular Force activities if collective exercises are curtailed. The Reserve units have been mission tasked to provide mortars, assault pioneers, cyber protection, and other capabilities that could contribute to operations globally. The integration will happen, he pledged, even if some of it has to be done virtually.

As part of a change to the Army’s Managed Readiness Plan to have one division rotating through operations and another on standby to meet the “concurrency of operations” requirements laid out in the government’s 2017 defence policy, 5 CMBG will not attend Exercise Maple Resolve, the Army’s largest brigade-level exercise, next spring. Instead, brigade units will undergo mission-specific training for battle group formations in advance of the first of two rotations deploying to Latvia and elsewhere.

1 Canadian Mechanized Brigade Group will assume the role of “brigade in the box” in Wainwright, Alta., as it prepares to hold a readiness posture for the 12 months beginning July 2021, before taking over operations from 5 CMBG in 2022. Instead, 5 Brigade will likely conduct theatre-specific mission training at that time.

The virtual roles may not be ideal, but they serve a purpose, said Carpentier. “In our collective training, force protection measures will be paramount. Since this pandemic started, we’ve been building strong foundations and we want to continue keeping people safe, avoiding becoming vectors of propagation for the virus and protecting the force.”

COVID-19 has disrupted the training schedule, but it won’t prevent the Division from meeting its obligation to generate forces ready for deployment, he added, including having personnel available to respond to domestic disasters and further pandemic assistance.

“I am very comfortable with how we are able to align things to be ready for our expeditionary deployments,” he said. “There is resident knowledge and experience. We are going to have plenty of time to do all of the individual training that is required, to complete the proper ratio of qualifications before deployment, and the time to do our mission-specific training.”

While the pandemic may be the primary obstacle along the road to high readiness, Carpentier is using several recent incidents of racist and hateful behaviour and sexual harassment in the Canadian Armed Forces to reinforce the Division’s ethics, values and code of conduct. Serving with honour is inculcated in professional military education, but the commander wants to ensure a culture of respect for all Canadians, regardless of ethnicity, sexual orientation or religion, is well understood and accepted.

“It is one thing to talk about it in a formal setting, in a classroom on a course, but it has to be part of what we talk about in units, in barracks. We understand courage under fire but we need to emphasize that courage is also required to ensure a culture that fosters effective and cohesive teams. We need that courage in garrison in everyday life. We need to speak up at the appropriate moment when we witness something.” ■



Members of Bravo Company, 1st Battalion, The Royal Canadian Regiment, fire the Carl Gustaf recoilless rifle as a part of pre-deployment training. Photo: DND



Ready For Adaptive Dispersed Operations

The Army's Modernization Strategy

By Chris Thatcher

“Land power continues to be extremely relevant in the contemporary security environment,” Lieutenant-General Wayne Eyre said as he settled into an office chair in late September for a rare in-person, but physically-distanced, interview.

The Army commander will launch in the next few months a five-year change agenda called *Canadian Army Modernization Strategy: Advancing with Purpose*, a key waypoint in the 15-year development of the Army's capstone operating concept, *Close Engagement: Land Power in the Age of Uncertainty*.

If Close Engagement is a vision for the future – outlining how the Army will need to be structured, manned and equipped to fight while adapting to and adopting emerging technology in a complex threat environment – then the modernization strategy is an interim step to ensure progress is on the right track.

The Army faces an ever-evolving security environment shaped by increasingly complex “below-the-threshold” conflicts, emerging domains, climate change and the rapid rise of new technologies, all while delivering on a defence policy that demands the execution of multiple missions simultaneously in potentially vastly different theatres. And whatever advantages greater sensors and standoff weapons offer sea and air power, land power has lost none of its relevance.

“The ability to control ground rests in the land domain,” Eyre emphasized. “That hasn't changed since the days of the Roman Legions. But how we are employed has changed significantly. We think traditionally of land power as being about combat. And we still have to be able to fight and win the conventional fight. But it is also everything else we are being asked to do that we have to be successful at. It means a much more agile mindset.”

Modernizing to maintain relevance is being driven by two efforts: an adapted Managed Readiness Plan (MRP) taking effect this year and a restructuring initiative called Force 2025.

The MRP was designed 15 years ago, in 2005-06, to deliver a force for





LGen Wayne Eyre during a visit with members of 2 Canadian Mechanized Brigade Group during Exercise Unified Resolve in February 2020. Photo: Pte Robert Kingerski

the conflict in Afghanistan. It mapped out an arduous, year-long road to high readiness (RTHR), followed by theatre-specific mission training, and then deployment. “But we had very little sitting on the shelf of any scale in case [something else] came,” said Eyre. “We are going to change that.”

The revised plan will see a brigade complete the RTHR and then hold in a readiness posture for the year. In the months before deployment on predictable missions such as Operation Reassurance or Impact, it will conduct mission specific preparation. The aim, Eyre explained, is to better balance the task load and tempo for the brigade and spread out the RTHR. “What it means is we have forces on the shelf ready to go, especially as we take a look at the NATO Readiness Initiative, which we have to provide for starting in 2021.”

To get to that state of a brigade on deployment and one on standby, the Army will assume some risk this year and “rip the band aid off” by putting both 2nd Canadian Division (2 Cdn Div) and 3rd Canadian Division (3 Cdn Div) through the RTHR cycle simultaneously, though each with a somewhat different experience – 2 Cdn Div will conduct its culmination exercise at the battle group level rather than Maple Resolve, the annual brigade validation.

2 Cdn Div will then become the “predictable deployment division” as of next July, conducting operations in Eastern Europe and the Middle East, while 3 Cdn Div enters a holding phase. “They will be on high readiness for a year if something comes up,” he said, “and they will go on predictable deployments the year after.”

The second but equally significant initiative is Force 2025, a thorough review and possible restructuring of an Army that has changed minimally from an earlier construct, Force 2013, that advantaged the field force over the institutional army.

“What we want to do is look at the entire Army – Regular and Reserve Force, field force and the institution – and make sure our structure is right, and that we are designing the Army we need for the future,” said Eyre.

That will require the input of every Branch and Corps and could involve asking some difficult questions about the capabilities the Army requires and can afford, he acknowledged. “We may have to make some hard decisions, especially if resources don’t come and we have to design an Army that is going to be relevant for the future, relevant for the security environment, relevant for what the government wants. Don’t know what those hard decisions are going to be yet. As the team frames the options, those hard decisions will become apparent.”

POSTURING FOR CONCURRENCY

The modernization strategy encompasses four lines of effort: Posturing for concurrency; enhancing the human domain; integrating One Army; and targeted investments.

In successive documents over the past two decades outlining the Army’s future force employment concept, the idea of Adaptive Dispersed Operations



Members of 39 Brigade Group completed the Basic Military Qualification (BMQ) course in August 2020 after a pause in training due to the pandemic. Photo: DND

(ADO) has been central to its structure. As part of posturing for concurrency, the review will delve into what is now required for the Army to be “ADO ready,” Eyre explained.

“What does a rifle company or a battle group that operates in ADO need to look like? What capabilities do we need and where do we need them? And just as importantly, what Reserve mission tasks do we need to feed into that?”

Through the Strengthening the Army Reserve (StAR) initiative, launched in 2015, every unit in the Reserves will have a mission task it can realistically generate and sustain with part-time capability. “Tied to the MRP – this is where the two come together – we want to be able to tell a Reserve unit, ‘four years from now you are going to generate capability X at platoon size on Y days’ notice to move’,” he said. “It’s about creating predictability [and] ... enhancing our operational output, where these mission tasks add expertise and mass to our ability to deploy.”

Related to that is an expanded role for the Reserves in domestic emergency response. Over the past five years, the Canadian Armed Forces (CAF) has seen a 1,000 percent increase in Operation Lentus taskings. One option under consideration is bringing the Reserves onto full-time service for specific periods each year. The Army is also seeing how it can make the best use of full-time summer employment. “We are still exploring that space,” said Eyre.

Posturing for concurrency will ensure alignment between the MRP and ongoing changes in the training system, including the expanding use of

simulation and networked training centres. It will also “give some direction on concept development, what concepts are most important and where we can put our limited capacity, [such as] refreshing our Arctic operating concept.” In line with that, Eyre foresees a rewrite of *CFP 300: Canada’s Army*, the keystone doctrine manual which was first published in 1998.

ONE ARMY

The second line of effort, enhancing the human domain, is intended to ensure mission ready forces. In part, it will build on health and wellness strategies already in place under Military Personnel (Mil Pers) Command. “Going into combat, we want our troops to thrive in that environment,” said Eyre, “so we want to give them the necessary tools and resiliency.”

The effort will also tackle pressing concerns around professional military conduct, including sexual harassment and hateful conduct, and increasing diversity in the ranks. To expand the traditional recruiting pool, “we have to have our Army look like the rest of Canada,” he argued.

Other pending changes, some already underway through Mil Pers Command, will revamp a dated personnel administrative system and provide more flexible and personalized career paths while, “at the same time, remembering that we have to privilege the production of combat capability.”

Eyre is also pushing for “more ways to fill the gaps between our episodes of professional military education.” In particular, he wants a better understanding



A member of the enhanced Forward Presence (eFP) Latvia Battle Group during Exercise Cabrit in August 2020 to increase interoperability among eFP mini unmanned aerial system capabilities. Photo: DND

of the military applications of emerging tech such as artificial intelligence and robotics. Leaders need the tools to deliver such programs in their organizations and Army Command and Staff College will soon be promoting online resources. “We have to outthink adversaries [and] think our way out of the challenges of the future, and the only way we are going to do that is to ensure our leaders are professionally developed and have the intellectual agility to face the future.”

Among his recommendations could be an expanded reading list of science fiction titles. “Maybe looking at science fiction and opening up creativity to think about different possibilities is a way of doing it,” he mused. “The Australian Defence Academy is taking a look at this and has been quite successful. AI is going to be a game changer; we just don’t know exactly how yet.”

The third line, One Army integration, will focus on efforts to integrate all components of the service. Particular attention will be paid to the Reserves and the Canadian Rangers. Reservists can expect an operational soldier policy to improve predictability for the individual soldier and help leaders develop unit capability. Rangers will eventually see the fruits of an enhancement program that will update their governance, personnel and finance policies and examine their command and control structure and the staffing and resources of patrol groups. “That is going to be a major undertaking, which we are starting right now,” explained Eyre, who recently promoted a new Director of Canadian Rangers to a full-time position in Army headquarters.

DIGITAL MINDSET

The modernization strategy will reinforce an effort that has been underway for many years across the CAF – transitioning the Army from an analogue to a fully digital force. That means looking beyond the conversion of paper processes to digital forms, to how new technology can be leveraged across all aspects of the service to fundamentally change how a process is delivered. “Going digital is a mindset,” said Eyre. “It’s not just about digitizing our data; it’s having the mindset to change our business processes.”

Not surprisingly, that makes the Land C4ISR and Land Command Support Systems projects among the more important of the Army’s targeted investments – the fourth line of effort. Eyre said he hasn’t prioritized a list of individual projects specific to Force 2025, but there are five areas he is focused on.

“We know we are going to be a LAV 6-based Army for the next generation. What does that mean? Those platforms need to be networked, so the network (Land C4ISR) is a priority investment area. We have to be able to protect them, so investing in capabilities such as Ground-Based Air Defence that can protect that force against emerging threats. For the soldiers inside them, soldier systems are absolutely critical, so projects like Soldier Operational Clothing and Equipment Modernization and Night Vision Systems Modernization. Fourth is the pan-domain combat enablers, how we enable that force with the combat support requirements such as Bridge and Gap Crossing and Light Utility



Sgt Frank Monahan, 1 Canadian Ranger Patrol Group instructor, searches for a potential aircraft landing zone with a Canadian Ranger near Hall Beach, Nunavut during Operation Nunavivut 2017. Photo: Sgt Jean-François Lauzé

Vehicles and Logistics Vehicle Modernization. And then there's the integrated training environment, the suite of simulation systems that you need to be able to train that force."

With the CAF promoting a "joint pan-domain command and control system," he's tasked the Army's Chief of Staff of Strategy to assess the interoperability of existing C4ISR systems, many of which were procured in stovepipes, to ensure "going digital" doesn't stall because of communication problems. "We have to be able to plug it into the joint C4ISR backbone, and we have to make sure all of our projects can be meshed together," he said. "Too much of what we have now can't talk to each other."

That interoperability extends to "keeping up with the allies," especially the U.S. Army and its evolving Multi-Domain Battle concept. In August, Eyre signed a Strategic Vision Statement with his U.S. Army counterpart that included long-term interoperability. "That is our most important relationship. We still have great ambition to have interoperable brigades in each other's divisions, battle groups in each other's brigades, and the like. We continue to exercise that wherever we can."

He noted that a lot of interoperability standards are now based on ABCANZ (American, British, Canadian, Australian and New Zealand) Armies program. "This summer it was our turn to provide the Chief of Staff for ABCANZ; we posted a colonel to Washington, and that is proceeding well." In that vein, the Army is also examining where and how best to place liaison officers and

exchange officers.

The digital thrust could also be hampered by a shortage in the Signals Corps. The Army recently launched what Eyre is calling a Signals "get well program" to look at everything from the Corps and trade structure to equipment, recruitment and retention. The review will encompass how the Land Command Support System is employed, how it could be improved, and what role cloud technologies might play for signallers. "Perhaps by going to a cloud solution we can reduce the force structure at the front end," Eyre noted. As the Reserves build up their cyber mission capacity, that could provide "untapped potential" to fill some gaps, he added.

By 2025, Eyre hopes the modernization strategy will lead to an Army "that's better postured for the challenges of the future, more agile, and well on its way to having a structure that is more appropriate to the future security environment." Moreover, it will be an Army highly capable of adapting to constant change. "It is a mindset we are inculcating as well," he said. "The structure and the equipment we have now may not necessarily be what we need five years from now.

"I know it will have a shelf life. I will put it out there and it will be our change agenda for five years. And before five years is up, we'll realize something has changed and do some course corrections. That's the nature of it. We're not going to get it right, but we have to get it right enough." ■



Transitioning To Meet New Challenges

As the Royal Canadian Electrical and Mechanical Engineers Corps (RCEME) enters the last quarter of its first century, it's facing new challenges to how it operates in the modern battlefield.

BY ALLAN JOYNER

The vehicle maintenance section of the Support Flight of 408 Tactical Helicopter Squadron during Exercise Maple Resolve 2016 in Wainwright, Alta. Photo: Allan Joyner



Anniversaries have a way of encouraging introspection. Last year's anniversary of the Canadian Electrical and Mechanical Engineers (RCEME) Corps was no exception. After 75 years of evolving roles, RCEME is in a transition, and not for the first time.

The Corps provides the Army's organic equipment engineering, maintenance and support. Since its inception during the Second World War, the Corps has conducted repair and maintenance from the forward edge of battle back through the various repair lines in theatre, all the way to large Canadian maintenance and repair depots. As well as being skilled technicians, technologists or engineers, RCEME members are also extensively cross-trained as combat infantry, a point of pride throughout the Corps.

Brigadier-General Robert Dundon, with over 30 years of experience in the Corps, is Director General of Land Equipment Program Management (DGLPEM). He underscores the importance of RCEME's motto, *Arte et Marte*, (By Skill and By Fighting) and firmly believes it must remain at the heart of the Corps' values.

"On the battlefield, we have a monopoly on maintenance and we have to be cognizant that there's no one behind us, no civilian contractor," he said. "We are the capability of last resort and we have to think that way."

There have been four distinct phases in the evolution of the Corps, and the RCEME Craftsman who waterproofed thousands of vehicles to support the landings in Normandy during the Second World War would scarcely recognize the technicians in Latvia today who are repairing small reconnaissance drones.

From its birth in 1944 through the entire Cold War, the combat service support duties of the Corps existed in a line-based system designed to accommodate the presence of effective artillery and air-ground attack capability in the opposing armies. The work performed among the various lines was based on what was required to counter the movement and engagement times for Soviet artillery units.

For most of that era, technology advanced at a moderate pace. The soldier-technicians were trained to defend themselves in duties such as mobile repair team calls, where vehicles were recovered from the field of battle. Maintenance platoons and maintenance companies performed their own organic defensive duties and RCEME personnel took as much pride in their ability to fight as they did in their dedication to keeping the Army's weapons and equipment operating.

With the collapse of the Soviet Union, there followed a period of almost 20 years of deployments in support of the United Nations and NATO. Canadian units operated in theatres such as the former Yugoslavia, where the threat was largely still Soviet-trained. A move toward more centralized maintenance support began at that time and it shaped the RCEME presence during those deployments.

After the terrorist attacks of 9/11, RCEME units deployed to Afghanistan in support of NATO operations. There they served within a system largely controlled and defined by United States Army doctrine. Complete air superiority and an almost total lack of any artillery threat allowed for even more centralization that had begun in the previous years. It was taken to extremes in 2006 when the bulk of the Canadian Army's support elements occupied space within the large superbase at Kandahar Airfield (KAF).

Outside the fences of KAF, craftsmen performed duties in battlefield recovery and support to the various forward operating bases where the maintainers were very much in the line of fire. The bulk of the time-consuming work, however, was performed inside the secure perimeter of KAF.

Back in Canada, the same period saw another change as increasingly complex equipment pushed the Army's requirement for outside contracting. Civilian companies began performing some of the maintenance and repair duties in Canada that had previously been done internally by the Canadian Armed Forces. The effect of that has been a transfer of work and far greater



Technician Cpl Vincent Cabana. Photo: Sgt Nathan Barbary



Vehicle technician Cpl Mike Tremblay. Photo: Sgt Nathan Barbary

interaction between maintainers and civilian contractors.

Today, RCEME is involved in deterrence operations in the Baltic States, as well as in Iraq, often conducted in uncertain environments. While many of those deployments have been relatively modest, the challenges they've generated have been considerable. And with the possible return of state-on-state conflict, and an increase in complex domestic natural disaster responses under the umbrella of Operation Lentus, new challenges are emerging.

Among the emerging trends is specialization, where no craftsman can hope to know everything she or he needs to in order to support increasingly complex equipment. Greater centralization remains a factor. So too does the rapid integration of civilian and military maintenance support, typified by contracts such as those supporting the Land Command Support System (LCSS); one civilian contractor for engineering and integration and another to support the system's extensive software have forced an increasing amount of adaptability in RCEME's way of doing business.

Other factors affecting the Corps include the increasing cost and digitization of systems, the ever-expanding size and weight of the Army's heaviest tanks and armoured vehicles, and the adoption of autonomy on battlefields, where mass-effect artillery has been replaced by long-range precision weapons.

At the RCEME's executive level, the catchphrase "agile and relevant" has been used to inform the Corps' response to these challenges.

One of the first and most important things to be addressed was the growing dissonance between the demands of future conflicts and the seemingly rigid structure of RCEME's Land Equipment Management System (LEMS). While recent years have seemed to suggest irrelevance for the old-style lines of maintenance, the inherent safety and effectiveness of such modes may well be required if state-on-state warfare is resumed. A modernized, more flexible LEMS system has to fully empower agile soldier-technicians on the future battlefield.

Relevance will depend on expanding the technical skills of RCEME

engineers, technicians, and technologists. Investing in them will allow for more advanced battlefield repair and increased understanding of digitization and its protection from cyber threats. Advances in autonomous systems and in artificial intelligence that offers more effective predictive maintenance will be critical to both agility and relevance.

It's worth noting that Army systems and equipment are now approaching a level of complexity that both the Navy and the Air Force have worked to support for many years. Like those maintainers, RCEME needs to specialize and focus on advanced technology to remain relevant.

On a practical level, the Corps must return to its previous emphasis on productivity measured through repair time and overall rates of repair. Rates of 95 percent serviceability in a formation's equipment would be envied today – the complexity and cost to repair some fleets has dropped serviceability to as low as 50 percent. Adapting available technology to allow reach back to specialized knowledge could provide significant improvements in this area. For example, pictures and video shared between distant locations could provide increased on-site ability to repair vehicles that today are often shipped across provinces to a centralized repair depot.

As DGLEPM, Dundon often finds himself trying to chart a course for the Corps through these challenges. He believes that the traditional bundling of RCEME's functions into the overall logistical field of Combat Service Support hamstrings the kind of creative doctrine that will be required to maintain the Corps' effectiveness.

"We need to break out of the box," he said. "We need to work toward our own original strategy, structure, systems, skills and culture. Agility means recognizing RCEME has to adapt to swings in the strategic and tactical situation. Relevance for us means embracing technology in all its forms. Western strategy for the foreseeable future will be based on technological overmatch. We need to enable it." ■



The Pathfinder Course includes every kind of insertion and extraction in the Canadian Armed Forces. Here, candidates rappel from a CH-146 Griffon helicopter. Photo: Cpl Darcy Lefebvre



AGAINST THE ODDS

by MCpl Mark Kusi-Appiah

The Patrol Pathfinder (PPF) is a legendary course run by the Canadian Advanced Army Warfare Centre, where mythical bush creatures crawl out from underground and attend as candidates. Those who pass would be reclaimed as commando gods at their home units. This was the mindset I had when I first heard about the Patrol Pathfinder Course.

I did my research and found a *Truth Duty Valour* episode on YouTube, and instantly I was hooked on the pathfinder's history and the challenges of the course; needless to say, I also admired the badge: a winged torch.

As I scrolled through different articles, I discovered many that said that it would be impossible for a Reservist to attend and actually pass; the two most prominent reasons being obtaining the prerequisites required for PPF as well as accruing the required time in the Canadian Forces. However, years later I found myself rapidly ticking off those prerequisites and collecting relevant experience by going on my Basic Reconnaissance Course and patrol competitions such as the Canadian patrol concentration in CFB Wainwright.

At last, in 2018, I was given my first opportunity to attend the course. Unfortunately, I didn't make it far due to a condition I suffered during a ruck march called rhabdomyolysis, a condition whereby your body is overworked to the point where your muscle starts to eat itself for energy, which can cause kidney damage. This also put me in the hospital for a couple of days and eventually I was 'return to unit' with a 'breathe only' chit.



Photo: DND

Fortunately, I had made a great impression on the staff before exiting the course, and all remembered me as that guy who “thundered in just 200 metres from the end.” I was given the okay to come back on the next course, which also gave me a year to train and focus on when that rhabdomyolysis comes back around.

During my year of prep, I accumulated over 150 kilometres of rucking and was able to attend pre-pathfinder training with the 3rd Battalion, Royal Canadian Regiment (3 RCR). From there I arrived back on course in mid-August 2019.

The PPF course is about three months long. You practice every insertion and extraction technique available to the Canadian Armed Forces, from the Fast Rope Insertion Extraction System (FRIES) all the way to floating on and off a submarine. You are also required to deliver immersive, clear, and concise orders while coordinating with multiple assets and commanders under stress. One of the perks about this course is that it takes you all over Canada.

Our course of 20 candidates started with a physical fitness evaluation by Personnel Support Programs and the drawing of multiple blood samples by Defence Research and Development Canada scientists as part of the research they were conducting on the candidates. Throughout the

three-month-long course, the candidates’ blood was periodically drawn for data collection.

The first week included a 20-kilometre ruck march with about 80 pounds of gear (before water and rations) and had to be completed in under four hours and 30 minutes. Then candidates underwent



Photo: DND

multiple days of navigation practice, water drills, and skills assessments. Only seven passed the navigation test on the first go. Unfortunately, those who didn’t pass had to retry again, with some having to do the test multiple times consecutively. Due to the environment and injury rate, by the end of that

gruelling week only 13 were left on the course.

Candidates then commenced a week of theory classes and orders before returning to the field to conduct standard operating procedure (SOP) training, watermanship, and PPF operations. This is where we learned the majority of how to operate as a pathfinder. To my surprise, we actually called in real jumps and beachheads that week. Unfortunately, two more candidates were injured, leaving only 11.

Before going on the course, I began working on strengthening my mental resilience and attained a different mindset after reading the book, *Can’t Hurt Me: Master Your Mind and Defy the Odds*, by David Goggins, an ultra-marathon runner and former U.S. Navy Seal. He mentioned that during his hell week he would set small goals and keep his optimism up. Thinking like this helped me get through the increasingly tough times, and also had the side effect of raising the morale of those around me. It seemed like whatever obstacles or challenges came our way, we would simply say, “Roger that,” and continue on. As a result, we created a solid team that helped each other through hard times, which is essential for a course of this nature.

However, there were many times where you had to push through on your own. The ability



Photo: DND

to understand that the pain and exhaustion were amplified in my mind and that my body can overcome, is what kept me going. Finding ways to claim a bit of your normal lifestyle helped, too. I found my norm with a bag of gummy worms that my girlfriend gave me. Those reminded me of the times when I craved them during long road trips, and that I could never leave a gas station without purchasing a bag. That humanized my mental state.

Training continued with a very well-orchestrated SERE (Survival, Evasion, Resistance, and Escape) course. We then had a full weekend to recover before we were off to Vancouver Island for 10 days to conduct the water phase of the course. From there we worked with Fleet Diving Unit (FDU), Naval Tactical Operations Group (NTOG), 406 Squadron (and their new CH-148 Cyclones), and a Royal Canadian Navy unit at CFB Esquimalt. We also got a tour of a frigate ship and a submarine. During our time there, we boarded an Orca-class patrol ship and based our missions in the Pacific Ocean, returning to the ship once finished.

After we got back to Ontario, we had a couple of days off before moving to Quebec for the last three weeks of the course. On our drive to Quebec we stopped in Petawawa to train with 427 Squadron to conduct FRIES training.

At CFB Valcartier, Que., we had a Helicopter

Insertion Master package with 430 Squadron and also practiced building a rope bridge using candidates who were either Advanced Mountain Operations or Basic Mountain Operations qualified.

From there, the last two weeks were spent in and around the Quebec City area, conducting



Photo: DND

missions both in wooded areas and urban settings, which greatly challenged our thinking dynamics.

Unfortunately, it wasn't a clean finish towards the end of my course. I was sent to a progress review board (PRB) after failing my last assessment and I was force-rested for 24 hours

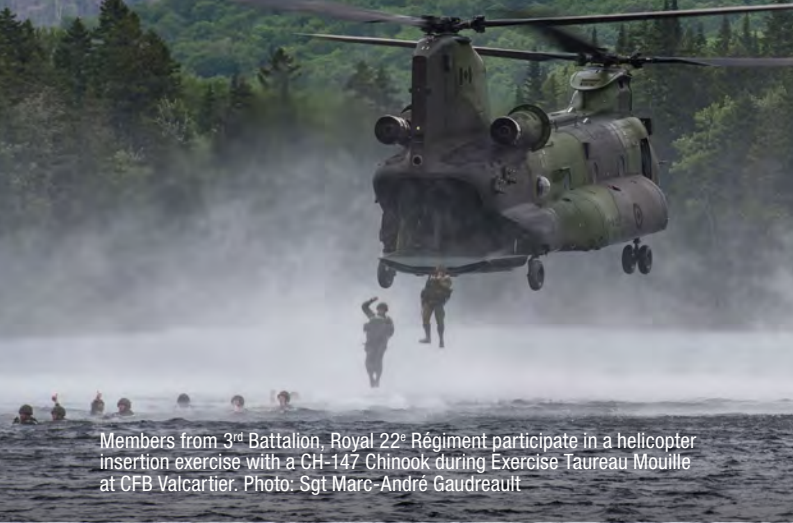
— of which I probably slept 22 of them. I was given one last chance to pass as a result of the PRB. Thankfully, a day later, after completing my final mission on the Le Massif ski hill in Charlevoix, I was debriefed and sustained an effective score on the aforementioned assessment, thus successfully completing PPF. This brought a wave of different emotions through me — after all, I was one of less than five Reservists to have ever passed this course.

In the end, nine candidates passed PPF with a victory mission and torch ceremony conducted at the Citadel in Quebec City.

This success made it clear that the old stigma of Reservists not being good enough is false, and that I have opened the possibility of challenging PPF in the thoughts of potential candidates back at my home unit. One of my ultimate goals from this experience is to hopefully have left the sentiment in the minds of others that, “If Cpl Kusi — the guy who forgot his T-shirt on his first parade night — can do it, so can I.”

Nothing is gained without great labour. ■

This article was originally published in the 2020 edition of The Rifleman, a publication of The Queen's Own Rifles of Canada.



Members from 3rd Battalion, Royal 22^e Régiment participate in a helicopter insertion exercise with a CH-147 Chinook during Exercise Taureau Mouille at CFB Valcartier. Photo: Sgt Marc-André Gaudreault



Members of the 2nd Battalion, Royal 22^e Régiment, conduct an extraction with a CH-147F Chinook during RIMPAC 2016 in California. Photo: Sgt Marc-André Gaudreault



Cpl Reyhan Hosein from 3 PPCLI tests an MRZR during Exercise Rocky Ascent in Nordegg, Alta., in May 2017. Photo: MCpl Brandon O'Connell

Tactical Mobility

Light infantry battalions could soon have a faster and more agile way to reach their objective.

By Chris Thatcher

When Canadian Army Light Forces next deploy into a conflict zone, it could be on a fleet of four-wheeled, lightweight, off-road vehicles. A request for information (RFI) went out to industry this fall to help the Directorate of Land Requirements project team fine-tune a capability that would help light infantry reach off-road objectives far quicker and easier than by foot.

“I’ve written the statement of requirements (SOR) for this vehicle based on feedback from the user community and the Canadian Army Land Warfare Center (CALWC), and it will go out along with the RFI to gauge how much of it they can meet and at what cost,” said Major Tony Ross, the project director for what is known as Light Forces Enhancement (LFE).

“We will compare that data and figure out what is realistic in terms of quantity, cost and the capability they can provide. We can then write the project brief and proceed to the definition stage and narrow down the requirements.”

The project received Defence Capability Board approval last October, and the Army hopes to have the first vehicles with its light infantry battalions by 2023 and achieve initial operating capability by the summer of 2024.

“We want to get this capability to the units in line with the [Army’s] 2017 Master Implementation Directive – Light Forces, which saw full operating capability in 2025,” he said.

Ideally, that would be a single platform soldiers can modify in the field to meet their needs. But conversations with potential suppliers suggest the more likely solution is a platform available in two variants, combat and cargo, along with trailers, explained Ross.

The tactical mobility platforms (TMP), as they will be known, should be capable of transporting enough equipment, including weapons, ammunition and water, to sustain soldiers for 48 to 72 hours.

“They will be operated by one driver, with space on the top for a gunner who will be able to operate the section’s heavy weapon systems, up to a TOW missile or automatic grenade launcher system,” added Ross.

Final quantities have yet to be determined, but the plan includes enough for the Army’s three light infantry battalions, as well as the three light engineer squadrons and three light artillery tactical groups.

A first tranche of TMPs will also be delivered to Reserve platoons with mission tasks such as mortars, direct fire support and mobility support, previously known as pioneers. At present, there are three of each within Canadian Brigade Groups across the country. A second tranche may go to Reserve troops tasked with infantry reconnaissance.

The vehicles might also be added to the inventory of specialized units such as light electronic warfare and intelligence support, and to Reserve influence activities companies.

“We figure between 300 and 330 ultra-light tactical mobility platforms,” said Ross, “210 to 230 of the tactical variants and 90 to 100 of the cargo variants. I have proposed a few recommendations of how these would go out, but ultimately it will be up to the Infantry Corps and Corps directors, working with the chains of command, to decide how these are distributed.”

Ross has viewed a number of options and said at least seven or eight vendors could submit bids when the request for proposals is released. Possible contenders include Polaris, Jankel, Haulotte Group, Supacat and DEW Engineering, Plasan, Pardus, Oshkosh Defense, and AADS J8 Jeep.

The Army conducted a buy and try with ultra-light mobility in 2017 and 2018, acquiring and distributing 36 Polaris MRZR-D four-wheeled utility task vehicles and 12 trailers across the three light battalions to determine how well a lightweight off-road vehicle could handle the various operational scenarios in



Soldiers disembark a CH-147 Chinook during Exercise Common Ground II at CFB Gagetown in November 2016. Photo: Cpt Peter Ford



During trials, wetlands and obstacle crossings challenged the MRZR. Photo: DND



Paratroopers from 3rd Battalion, Royal 22^e Régiment parachute from a CC-130J Hercules in November 2019. Photo: Pte Jessica Blackburn

difficult terrain. While the vehicle received some favourable reviews and proved the concept of getting soldiers and gear to a target much quicker than humping in on foot, the trials demonstrated, especially in Quebec, a need for a more robust capability for obstacle crossing in wetlands, forests, and other terrain.

“Whatever capability we provide, it has to be better at obstacle crossing,” he said. “But the MRZR did meet a lot of the needs of the Light Forces in that it provided that platform to carry gear and get soldiers around quickly, especially out West on the prairies.”

The Canadian Special Operations Forces Command procured the Polaris DAGOR, a larger variant of the MRZR, and took delivery of the vehicles in late 2017 and early 2018.

Arctic capability is not a core requirement to the LFE project – the Domestic Arctic Mobility Enhancement project will acquire the Army’s future primary over-ice and -snow vehicles – but the TMPs must be capable of operating in the North. “The SOR says the TMP combat and cargo variants must operate at -40 C and over ice and snow, though they would probably be deployed to the Arctic in warmer months,” he noted.

Any conversation about LFE invariably brings up the Light Utility Vehicle (LUV) project, which is seeking replacements for the Army’s Mercedes G-Wagon and Chevy Silverado. Though the LUV solution may end up with Light Forces for certain tasks such as VIP escort or on-base transport, Ross emphasized the requirements and missions are very different.

“They don’t do the same thing. LUV will focus on a Canadian Armed Forces solution, for the military police, air force security, a lot of different things. LFE is designed specifically for the needs of the Light Forces. It has to be highly mobile. It has to go where other vehicles can’t go.”

The project team has been instructed to be “fast followers” and focus on platforms that have already been proven with allied militaries. “The Light Forces mobility piece is a puzzle many militaries are trying to crack – how to get soldiers quickly and as closely to the hard-to-access objective as fresh as possible,” acknowledged Ross.

That requirement of a proven track record might eliminate a few contenders, but budget constraints could force the team to keep all options on the table. Ross has seen price tags as high as \$350,000 per vehicle. His projected budget, according to the Defence Capabilities Blueprint, is between \$50 million and \$99 million.

“We have to be realistic about what we can acquire here. We are looking for a solution that is going to be cost-effective and meet Light Forces’ specific needs,” he said.

Mobility Equals Survivability

Historically, the Army’s light infantry battalions have lacked the full range of equipment necessary to make them a separate capability from dismounted mechanized forces. Though their effectiveness has been proven time and again – elements of the 2nd and 3rd Battalions of the Princess Patricia’s Canadian Light Infantry were key to the success of Operation Anaconda in Afghanistan in 2002, integrating with the U.S. Army’s Task Force Rakkasan – various commanders have warned of the consequences of not purpose-building a Light Force capability.

Failure to create a light weight, combat capable force “could lead to a situation where the Army finds itself strategically irrelevant when faced with certain situations due to a lack of appropriate capabilities [and] force structure,” Lieutenant-Colonel Dave Galea wrote in an article for the

Canadian Army Journal in 2005.

CALWC has led an effort since then to develop a concept for Light Forces that was formally recognized in the government’s 2017 defence policy. Investment 38 specifically called for the acquisition of communications, sustainment and survivability equipment for Light Forces.

The Light Forces directive, based on guidance from the defence policy, was divided into three spirals focused on the structure, capability and final delivery of Light Forces. Under capability, the initial list of equipment included tactical mobility platforms, dismounted anti-armour weapon systems, light weight soldier equipment such as load carriage, close combat modular fighting rig, body armour and specialized tools, communications systems, micro unmanned aerial systems, lightweight engineering and electronic warfare equipment, and a portable ground-based air defence system.

Those were eventually distilled down to three priorities: dismounted anti-armour weapon system, light infantry specific personal equipment and tactical vehicles. Most have since been assumed by other projects, leaving LFE to focus on tactical mobility.

Lightweight radios will be acquired through the Land Command Support System Tactical Communications Modernization project while new and lighter weight load carriage and body armour will be addressed by the Soldier Operational Clothing and Equipment Modernization program. A Carl Gustav upgrade project and an Anti-Tank Guided Missile Replacement project will provide some of the lighter and more effective anti-armour weapon systems.

“All those needs identified in the Master Implementation Direction are being taken care of in one way or another by other projects,” said Ross.

The need for better structured and more capable Light Forces is being driven by a future security environment that predicts conflict, humanitarian and natural disaster response in dense urban megacities and over mountain and jungle terrain medium forces might struggle to navigate. It is also in line with the Army’s operating concept of adaptive dispersed operations, where lighter forces might be better equipped to disperse for routine tasks and then aggregate to tackle larger missions.

“There will be some missions in the future where medium and heavy forces are not well suited,” he said. “Light Forces are strategically agile in that they provide a quickly deployable force that can prepare a theatre for follow-on medium forces if needed. They have a dual role. They can mitigate a tense security situation when Canada wants to act quickly in advance of slower deploying medium forces, or they can go in for those select operational environments where medium and heavy forces don’t work very well, especially situations involving complex terrain and the need to interact face-to-face with locals.”

Ross acknowledged that the adoption of an ultra-lightweight vehicle for Light Forces is probably counterintuitive given the lessons of recent conflict, where improvised explosive devices have been ubiquitous. Survivability in those conditions has often been equated with more armour. However, scientists with Defence Research and Development Canada have in recent years focused on lighter soldier loads to increase mobility, and therefore survivability.

“In Afghanistan, we started to think that more armour was going to make our guys safer, so we kept piling them up with more and more kit,” he noted. “The enemy can always develop a bomb that will penetrate the thickest armour. But if you give soldiers more mobility, they arrive fresher, less tired, and so more alert to danger. And they will be able to move across places that they weren’t able before, keeping the adversary guessing about the direction of the next move.” ■



Seeking new sources of water

By Major Don Parker

Cpl Donald Wray inspects a Reverse Osmosis Water Purification Unit (ROWPU) during Exercise Maple Resolve in 2013. Photo: Cpl Éric Girard

Potable water is essential to maintain life and conduct Canadian Armed Forces (CAF) operations anywhere in the world, but local sources cannot always be trusted. The CAF consumes potable water from two primary sources: a large Reverse Osmosis Water Purification System (ROWPU) designed for unit and formation level use, or by purchasing bottled water.

Because the ROWPU is co-located with the majority of personnel on an operation, detached sub-units (100-250 personnel) must depend on resupply convoys, often through hostile areas, endangering the convoy and escort personnel, adding mileage and repairs to vehicles, and increasing fuel consumption and greenhouse gas emissions.

This occurs whether they carry bulk water from the ROWPU or pallets of bottled water; the latter adds yet another layer of complexity as it creates a large amount of plastic waste.

Several years ago, the CAF identified the need to improve how water is provided at the sub-unit level, and the Advanced Sub-unit Water Purification System (ASUWPS) project was born.

It consists of two distinct capabilities. The first is to replace the existing 1,500 litre water trailers (colloquially known as Water Buffalos), which have begun self-divesting due to rust-out. The project will replace them with at least 210



A Heavy Engineer Support Vehicle lowers a ROWPU into position on a barge near Jacmel, Haiti, as part of Operation Hestia in 2010. Photo: MCp David Hardwick

of the new variants which hold twice the capacity (3,000 L). This larger capacity will allow sub-units to be self-sufficient for a 24-hour period and significantly cut the number of convoys, mileage, and greenhouse gas emissions for water delivery.

The trailers will include an integrated diesel-fueled heater for use in sub-zero weather and are designed to be towed by the new Medium Support Vehicle System (MSVS). The trailers will be distributed across virtually every Army Regular Force unit, plus Army Reserve brigades, the Royal Canadian Air Force (RCAF), Canadian Joint Operations Command (CJOC), and Health Services.

The second capability will deliver at least 26 water treatment systems capable of providing potable water for up to 250 personnel from virtually any source, including salt water. This capability will be delivered to Regular and Reserve force engineers in the Army, RCAF and CJOC (Disaster Assistance Response Team). These systems complement the current (and much larger) ROWPU systems and use the same reverse osmosis technology.

The current system requires a full 20-foot ISO (International Organization for Standardization) container (also known as a “sea-container”), which can be difficult to move in some locations, especially for disaster relief. The lower production rate of the ASUWPS and smaller size allows it to be housed in a quad-con (one quarter of an ISO container), with a second quad-con storing the pumps, hoses, bladders and miscellaneous equipment. Both quad containers mount onto a special trailer towed by the MSVS, but can also be handled by any

ISO container-handling equipment.

The small size and weight of the quad-cons compared to a full ISO container will permit greater options for shipping, movement, and handling, which translates into more flexibility of employment within a mission area, especially for Reserve units.

“The ability to finally have water purification equipment within Reserve engineer regiments has been a long time coming,” said Lieutenant-Colonel Steve Boychyn, commanding officer of 32 Combat Engineer Regiment in Toronto. “As the Reserves are deeply embedded into communities across Canada, this will enhance our ability to support domestic operations as well as supporting Reserve training without requesting Regular force assistance. It’s a win-win-win situation.”

The water treatment system will also include two other components. The first will be a support kit with insulated tents, heated hoses, and other necessities for cold-weather operation.

The second component will assist with water storage and distribution. They are best visualized as 1,000 L military-grade “wine-in-a-box” containers. They can be connected and stacked for greater storage, yet the small individual size will allow distribution by virtually any vehicle including civilian pick-up trucks.



Sgt Luc Tellier, then of the Unité régionale de soutien aux cadets (URSC) Québec, operates a ROWPU in Léogane, Haiti, as part of Op Hestia. Photo: Sgt Bruno Turcotte

They can provide additional storage for firefighting or other emergencies and are ideal for prepositioning or distributing water to civilians during domestic and international disasters.

“These containers are a game-changer on how the CAF can store and distribute potable water,” James Buell, ASUWPS project manager, stated. “They allow great flexibility with a small footprint and are ideal for smaller elements or locations that do not require a 3,000 L trailer every day. Best of all, when they are not in use, they can be rapidly folded down and stored virtually anywhere. This is great for units such as the Disaster Assistance Response Team, isolated elements, and training establishments.”

The ASUWPS project is transitioning from the definition phase towards implementation. Ministerial approval is scheduled for this fall, with contract awards by autumn 2021. Units will see the first components delivered in 2023.

In addition to the ASUWPS project, a second project has recently been raised. It will replace the 30-year-old large ROWPU and water bagging system with similar, but newer, equipment. This will ensure the larger water supply capabilities are retained at the formation level well into the future. Although the project is several years behind ASUWPS, the combination of these two projects will completely revitalize the CAF water supply system, allowing the CAF to provide water that meets Canadian drinking water standards to troops deployed in any operational environment. ■

How a Magic Box and a New Radar Delivered a Coalition Air Picture

By Chris Thatcher

The Army's Medium Range Radar (MRR) was a highly anticipated capability when it was acquired in 2018. Two years later, on its first deployment outside of Canada to support a multinational exercise, the MRR has drawn widespread acclaim and piqued curiosity about its longer-term potential.

In early March, in the sub-Arctic chill of Alaska, the MRR and a radar troop from 4th Artillery Regiment (General Support), working alongside a U.S. Marine Corps Air-Ground Task Force, became a vital contributor to a command air picture when others around them were struggling.

Arctic Edge is a biannual exercise led by Alaska Command, a subordinate command to U.S. Northern Command headquartered at Joint Base Elmendorf-Richardson. The exercise is intended to improve Arctic readiness of both Alaska-based troops and supporting units from across the U.S. For participating Canadian Armed Forces (CAF) units, it's an opportunity to practice the integration of what are often specific and, at times, unique capabilities into complex coalition operations.

In 2020, shortly before the coronavirus restricted large-scale collective training, Arctic Edge also provided the overarching context for two additional overlapping exercises, Arctic Eagle and ICEX. Though primarily an exercise for National Guard forces, Arctic Eagle included a chemical, biological, radiological, nuclear and explosive scenario that involved a 10-soldier team from 39 Canadian Brigade Group. ICEX, a U.S. Navy submarine exercise on and under the Arctic ice, included supply support from 440 Transport Squadron in Yellowknife, N.W.T.

In addition, a CC-130J Hercules from 436 Transport Squadron provided troop transport and air drops, including a U.S. Army paratroop jump near Fort Greely. Two CC-138 Twin Otters from 440 Squadron conducted medevac flights and transport of supplies and personnel into austere locations, including sea ice landings on an ice floe about 240 kilometres from the Alaskan coast during ICEX.

"The units that were participating all had niche capabilities that the Americans didn't," said Lieutenant-Colonel Scott Marshall, commanding officer of the Canadian Detachment at Joint Base Elmendorf-Richardson and the commander of the Canadian national elements during the exercise. "These exercises not only helped to highlight what the [Royal Canadian Air Force (RCAF)] and the Canadian Army can do, but ... they [allowed us] to operate with non-traditional American NORAD units. A lot of [the Americans] were from outside of Alaska, so it was an eye-opener for them."

The Army's medium range radar certainly fit the bill as a niche capability.



Members of the 4th Artillery Regiment (GS) control the MRR from the back of a LAV II Bison. Photo: Cpl Jordan Fountain

The MRR brings together what were previously separate air defence and surveillance target acquisition functions in one platform. It was initially intended to detect and locate sources of indirect fire such as rocket propelled grenades, mortars and other munitions that were fired at bases in Afghanistan. But in air defence mode, it can identify friend or foe targets such as aircraft at great distance.

Working alongside the Marines from the back of a LAV II Bison, the radar troop tracked live rocket rounds, accurately identifying the launch and impact points to within a diameter of 60 and 20 metres, respectively. The MRR also supported Special Forces operating at considerable distance, providing accurate location information of their two Chinook helicopters to the Marine Corps commander on the ground.

"One of the biggest things we offered was greater command situational awareness for assets operating in the area of operations, whether that was fixed-wing or rotary-wing assets," said Lieutenant Travis Fryxell, an artillery officer with the 4th Artillery Regiment (GS).



The Medium Range Radar deployed by the 4th Artillery Regiment (General Support) during Exercise Arctic Edge in late February 2020 near Fort Greely, Alaska. Photo: Cpl Jordan Fountain



Cold temperatures during Arctic Edge affected communications throughout the exercise. Photo: Cpl Jordan Fountain



A Tactical Armoured Patrol Vehicle (TAPV) helped provide security during the exercise. Photo: Cpl Jordan Fountain

Magic Box

That the MRR was able to share its air picture was due in no small measure to a little-known RCAF spoke kit, so-called because of its hub and spoke architecture. The magic box, as others quickly dubbed it, “allows you to get that communications infrastructure, no matter where you are in the world, as long as you have some basic rules,” explained Sergeant Tim Blindback, a Joint Interface Control Officer with 21 Aerospace Control and Warning Squadron at 22 Wing North Bay, Ont., the Canadian Air Defence Sector for NORAD.

“The box allows you to plug in a cell phone and as long as you have internet connectivity in any way, shape or form, you can get a good, secure connection back to home base and out into the world.”

Blindback is one of the Air Force’s foremost authorities on Link networks and had volunteered for the exercise when he heard planners needed tactical datalink specialists. He immediately recognized that communicating was going to be a challenge. Though the Alaska NORAD Region (ANR) had communications infrastructure and command and control systems to support the exercise, there was no Link 16 network to connect the MRR in the field to the exercise command centre. However, though the radar troop and Marines would be dispersed and “in the boonies” during the exercise, they could receive a cellphone signal.

The radar troop, based at 5th Canadian Division Support Base Gagetown, N.B., made a pitstop at Best Buy before heading north and bought a 4G modem puck and a sim card. When they plugged it into the spoke kit in the back of their Bison, “boom, we had connectivity,” said Blindback. “We were able to create a computer network and configured the system to pass Link 16 data over the computer network rather than over radio frequency.”

The significance of that became apparent as radios and other equipment used by various Marine, U.S. Army and National Guard units froze or otherwise experienced firmware failures in the frigid conditions. The spoke kit not only

connected the MRR to the exercise command, it also provided the air picture to the Canadian and Alaskan regional NORAD command centres and the national chains of command, including Canadian Joint Operations Command in Ottawa.

“That was huge because we did not have that capability before,” said Marshall. “[The Link and MRR teams] were the star of the show. They got to do a lot more than we expected, even with the grand scale of this exercise.”

Getting two systems to share data might not seem that remarkable. But “having it actually communicate with NORAD, because of the encryption and all the different computer systems and software languages, was a marvel,” said Fryxell.

No one had ever envisioned deploying the spoke kit – two heavy servers in a large Pelican case – in the back of an armoured vehicle, admitted Blindback. Though it was “overkill” for the purposes of Arctic Edge, it was a creative solution and an example of how to “make the best use of what you have at the time.

“It was designed to support forward deployments in other countries, like standing up a headquarters,” he explained. “It was meant to serve every possible network need that you might require. We only wanted connectivity to one network. But we saw the opportunity and we happened to have one for use. It took a lot of work to get it into place, but it worked out really well.”

For Blindback’s 22 Wing team, which was co-located with the exercise headquarters and served as the bridge to the MRR troop in the field, being able to provide the HQ staff with a complete air picture, including blue force tracking, and facilitate text messaging and basic chat over a secure connection, was gratifying.

“The Americans were ecstatic. They were able to look at the Ex staff and say, ‘We have active TDLs (tactical datalinks) in the field.’ That was something they weren’t able to accomplish domestically because of those problems with the equipment failures,” he said. “It gave the Ex the only TDL component that it would have had otherwise, and it proved Canada can show up and get stuff done.”

Validating Sub-Arctic Ops

The 4th Artillery Regiment (GS) itself is still learning what the MRR can do, and Arctic Edge helped validate a number of things, including Arctic operations, tactical datalink connectivity in extreme environments, and the troop's winter warfare skills, said Fryxell.

"There were a lot of lessons learned that we can take away from this. The single thing was validation that this system can operate in sub-Arctic conditions. That means we could potentially support the radars that cover our defence through NORAD, if one of the Air Force radars goes down."

The radar troop was even able to set up and connect two MRRs, a primary and secondary radar, at a staging area near Fort Greely, and validate and consolidate data that was then passed up to NORAD. "That was a first for us," Fryxell admitted.

Equally important for the artillery regiment was working with the Marine Corps, "brothers ... [with whom] we need to communicate and share information," he said. "[But] I don't think [they] believed we would be as important in their planning process as we were. When we first showed up, they didn't really have an idea of how they would fit us in. They didn't know the capability, which a lot of people don't. But this was a great opportunity for our guys to work with them and share that information."

The Medium Range Radar would likely have been among several new capabilities validated at Exercise Maple Resolve in Wainwright, Alta., this past spring. The capability has applications for current missions in Eastern Europe. Arctic Edge at least demonstrated how the MRR and a troop or battery could be employed if required.

"Arctic Edge just gets us talking about it some more," said Fryxell. "It's a new technology for the Army ... so we are learning it and we're learning how to employ it. Overall, Arctic Edge was a complete success for validating this radar's potential for operations." ■



L.Cpl Andrew Munoz, with 7th Engineer Support Battalion, 1st Marine Logistic Group, provides security at Fort Greely. Working with the Marines was a key component of the exercise for 4th Artillery Regiment (GS). Photo: L.Cpl Jose Gonzalez

MEL and Remotely Operated Platforms

By Dr. Dominik Pudo, Dr. Jean-François Daigle, Capt Joanne Clifford, Capt Angela Starchuk, MWO Richard Landriault



Searching for improvised explosive devices on Exercise Ardent Defender 2019. Photo: Pte Sarah Morley

Since the first demonstration of the laser (an acronym for Light Amplification by Stimulated Emission of Radiation) in 1960, its applications have become numerous and commonplace. Naturally, military organizations immediately began envisioning future applications of novel laser systems in combat.

Through numerous demonstrations over the past decades, strategic visionaries have remained steadfast in their goals, one of which includes being able to use lasers to destroy distant targets using a directed beam of focused energy.

Although directed energy weapons (DEWs) are not currently used within the Department of National Defence/Canadian Armed Forces (DND/CAF), various laser technologies have been in the inventory for decades. For instance, laser range finders are used to measure distances, laser target designators guide munitions to the desired targets, and directed infrared countermeasures protect military platforms by confusing and dazzling the seekers of incoming



SLICER on a tEODor remotely operated vehicle. Photo: DND

missile threats. These systems all use laser beams, however none can be considered as DEWs. That is, they do not produce the power levels necessary to inflict damage on a target from a safe, standoff location.

Recently high-energy laser (HEL) weapons have begun their irreversible transition into the modern armed forces. As laser technologies mature, their robustness has enabled countless demonstrations in increasingly challenging environments, consistently proving their ability to conduct specific tasks. From standoff neutralization of improvised explosive devices (IEDs), to countering drones, to engaging increasingly distant and challenging targets such as small

boats, rockets, or mortars, HEL weapons are continually tested against new and existing threats.

Underscoring this evolution is a race to increase the laser power delivered on the target; for example, the U.S. Navy is installing 60-150 kilowatt (kW) lasers on their destroyers, while the U.S. Army is working toward 250-300 kW systems. Laser power directly determines the range and lethality of the weapon system, while also reducing the required dwell time until the desired effect is achieved.

The trend of increasingly powerful laser weapons has pushed smaller, “medium-energy” lasers (MEL) into the limelight. They are nevertheless readily available on the market for industrial applications, and offer a tempting potential of yet-unexplored military uses. Compared to their larger siblings, MELs in the 100-500 W range are advantageous due to three key features:

- They are air-cooled, alleviating the need for a cumbersome thermal management system;
- They are lightweight and small, easily transportable by mounted and/or dismounted troops as well as unmanned platforms;
- They can be powered by battery packs, a cheap and rechargeable power source.

MELs are robust and reliable, supported by typical mean times between failures sometimes exceeding 105 hours. These are desirable, if not mandatory, requirements of military procurement; therefore it is reasonable to assume they could be seamlessly added onto any military platform, fit within a backpack-sized personal load, or be mounted onto an unmanned vehicle.

SLICER DICES IEDS

As part of Canadian military HEL research efforts, in 2017, Defence Research and Development Canada (DRDC) Valcartier began investigating niche applications where the addition of a MEL would add specific functionalities to existing systems. The project originated from exploratory discussions with stakeholders within the Directorate of Land Requirements, the Joint Counter Explosive Threat Task Force, and Explosive Ordnance Disposal/Improvised Explosive Device Disposal (EOD/IEDD) operators from the 5th Combat Engineer Regiment.

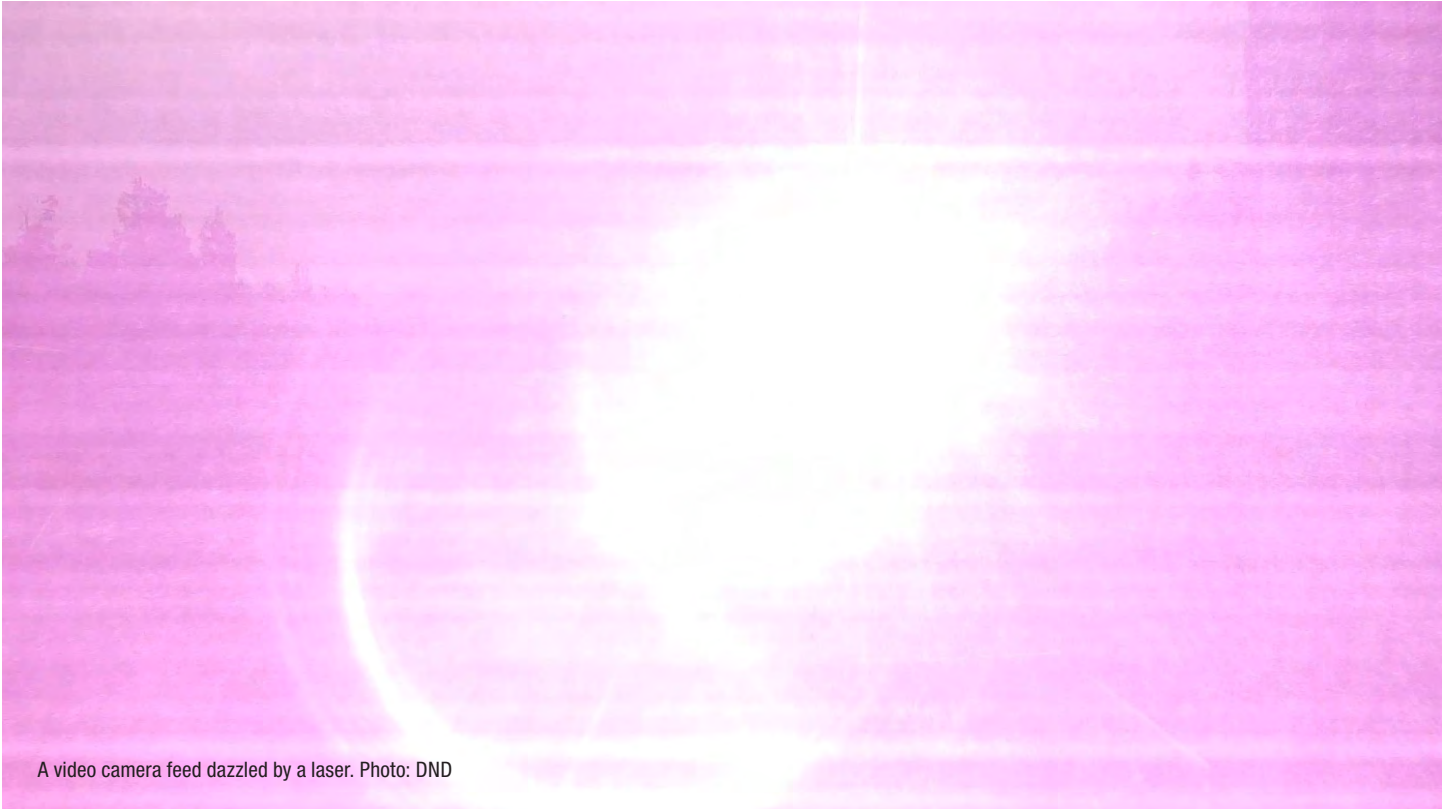
The consensus was to explore mounting a MEL system on robots used in IEDD render-safe operations. Specifically, the objective was to explore the usefulness of a novel tool utilizing a laser beam to cut and sever a number of specific targets at short ranges, such as duct-tape, cargo straps, rope or fabric. The result was the Standoff Laser Instrument to Counter Explosives with a Robot, a.k.a. SLICER.

The first-generation SLICER was integrated on a Telerob tEODor robot, the largest remotely operated vehicle (ROV) currently in-service with the CAF IEDD teams. The laser was optimised based on the specific scenarios and needs of the operators, while the interface and subsystems were designed to be integrated without hindering any of the ROV’s pre-existing functionalities.

The use of commercially available components allowed the project to evolve rapidly from the drawing board to complete systems testing in a little over a year. Exercise Ardent Defender 2019, an annual international IEDD exercise, used realistic scenarios to hone SLICER’s functionalities and to identify the context and tasks in which such a tool would be beneficial and complementary to the existing tactics, techniques and procedures (TTPs).

Notably, this was the first occurrence of a directed energy laser system being approved by the National Defence Laser Safety Office (NDLSO) for use in an exercise on a Canadian Forces base.

The SLICER tests were a success. The demonstration also provided proof



A video camera feed dazzled by a laser. Photo: DND

of a fundamentally new concept, the feasibility to employ medium-power directed energy systems integrated with remotely operated platforms. The small-scale entry/gaining access tasks performed on the ground, including the laser's ability to cut or drill through soft materials at close range, open up nearly unlimited possibilities to future Remotely Operated Vehicle (ROV) integration. For instance, one could envision a remotely piloted aircraft operator using a modular SLICER-like tool on a quadcopter to gain access to, and safely neutralize, an IED in a location otherwise impossible to access via the ground.

MORE MEL APPLICATIONS

Initial feedback from IEDD operators following Exercise Ardent Defender was positive. However, it also highlighted some aspects of a laser incompatible with current render-safe procedures; namely, the undesirable introduction of energy into a potentially explosive system. For this reason, the focus of the EOD/IEDD community has shifted to different areas of MEL applications. Using the SLICER tool success as a foundation, the community recognizes the importance of in-Canada research and development expertise in this emerging technology.

Firstly, in a climate of increasing environmental awareness, the EOD community is interested in a SLICER-like tool as a replacement for traditional explosives and de-arming tools when rendering safe conventional munitions. Unexploded, misfired, and otherwise unsafe munitions are commonplace on weapons ranges, war-zones, and occasionally found as collectors' items in residential areas. If proven successful as a disposal tool for these munitions, MEL systems would eliminate trace toxic residue by-products from the use of high explosive detonations during conventional munition disposal operations.

The same benefits would apply to the disposal of insensitive munitions, which normally require massive amounts of traditional explosives to detonate and/or deflagrate (burn) the filler.

Thirdly, as discussed previously, the military functionality of MELs extends well beyond their ability to remotely cut specific objects. Their power densities generated on-target are also sufficient to disable cameras or electro-optic sensors. Future MEL systems could easily be integrated on ground or air platforms and used to destroy hostile electro-optic surveillance and imaging sensors, thereby significantly reducing their situational awareness and targeting abilities. The need to have this

capability will increase significantly as lethal autonomous or semi-autonomous systems proliferate, such as those already demonstrated in Russia. As these systems rely exclusively on their electro-optic sensor suite, MEL systems could represent an effective countermeasure.

SAFETY CONCERNS

One of the core concerns pertaining to laser weapon system use is that of laser safety. Indeed, their power levels could result in ocular hazard distances extending for kilometers away from the laser source. However, the risk attributed to the use of such systems can be comprehensively mitigated by a number of approaches. In the DND/CAF, these are jointly developed by DRDC and the NDLSO, in conjunction with the National Defence Laser Safety Board (NDLSB). The NDLSB is chaired by the NDLSO and its membership has representation from the defence science community, the Quality Engineering



A pipe bomb neutralized with a HEL. Photo: DND



A laser target designator: Master Bombardier Matt Cyr, a JTAC, prepares for lasing at the weapons range during a training exercise in Romania. Photo: Capt Gabriel Ferris



An insensitive munition round neutralized by a HEL. Photo: DND

Test Establishment (QETE), Canadian Forces Health Services (CFHS), as well as key stakeholders from the Army, Navy and Air Force, among others.

Laser safety risks during training and/or otherwise controlled environments are necessary to mitigate, and may be addressed in several ways. Using the SLICER as an example, the demonstration area at Exercise Ardent Defender was required to ensure a sufficiently sized backstop in the line of fire. When in use, the TTPs mimicked the deliberate use of a kinetic weapon, with an appropriate danger area and “arcs of fire” established. An additional intrinsic safety measure included the system’s design for short-range engagements, which ensured that the divergence of the beam remained large so as to decrease the hazard zones.

If (or likely, when) MELs are used in operations (combat or otherwise), laser safety risks will have to be addressed differently than in training. In operations, the mission has primacy, and the soldier-operator is not in control of all aspects of the situation.

Similar approaches can be used to establish a safe framework for the use of a MEL mounted on remotely operated platforms. Interlocks driven by the system’s position and orientation can prevent emission outside of the authorized arcs of fire, while integrated rangefinders can disable the laser unless a target is within a given range. In parallel, advanced laser sources operating at much safer wavelengths are currently being developed.

Finally, probabilistic risk approaches can be used to establish realistic safety zones based upon a thorough mathematic evaluation of hazards, including population density and the likelihood of intersecting a stray laser beam. DRDC Valcartier, the NDLSO, and QETE work in close collaboration with NATO allies to develop and refine these approaches in order to ensure future interoperability of laser weapon systems.

While the development of laser weapons focuses on increasingly large, powerful systems, the availability and usefulness of small yet robust systems cannot be overlooked. Offering significantly smaller capabilities than their kW-class counterparts, MEL systems are nevertheless able to provide solutions to technological challenges with their unique advantages.

As the number and capability of remotely operated systems available to the DND/CAF continue to grow, so do their possible payloads. Therefore, research and development of compact laser systems suitable for such platforms should be given high priority. These MEL systems can and will improve current capabilities, as well as be tailored for unique capabilities based on mission specifics. ■

Dr. Dominik Pudo and Dr. Jean-François Daigle are with Defence Research & Development Canada, Capt. Joanne Clifford is with the National Defence Laser Safety Office, and Capt. Angela Starchuk and MWO Richard Landriault are with the Joint Counter Explosive Threat Task Force.



Major Mick Bioletti. Photo: USARPAC PAO



LGen Macairrog S. Alberto, Commanding General of the Philippine Army, and USARPAC Commanding General, Gen Robert B. Brown, during a visit in January 2020. Photo: USARPAC PAO



A Royal Thai Army soldier and a U.S. Army soldier get ready to be hoisted in a UH-60 Blackhawk in March 2020 as part of the Hanuman Guardian exercise in Thailand. Photo: Spc Ezra Camarena

DEFENCE DIPLOMAT

THE ARMY'S FIRST OFFICER IN U.S. ARMY PACIFIC HEADQUARTERS

By Chris Thatcher

When the Obama Administration announced a “pivot” to the Pacific in 2011, the proposed rebalancing of diplomatic and military resources renewed widespread discussion about the strategic importance of the Indo-Pacific.

With a population of over four billion and 24 of the world's 36 megacities, the region is a powerful economic engine, projected to generate 50 percent of global GDP and account for over 40 percent of global consumption by 2040. It's also home to seven of the 10 largest militaries in the world and a focal point for U.S. security interests, from competitive threats to rogue actors, terrorist groups and numerous defence treaty partners.

Compounding the security challenge is the threat posed by climate change. The Ring of Fire in the basin of the Pacific Ocean is a constant reminder of the potential for massive natural disasters and large-scale humanitarian operations caused by cyclones, earthquakes, tsunamis and volcanic activity, all exacerbated by a changing climate.

While the substance of the American pivot has been more a continuation of previous policies under new names, for the U.S. Army it has meant a strengthened presence, including an increase in the scale of bilateral exercises and expanded areas of military cooperation.

All of which gives Major Mick Bioletti a unique vantage point. Since 2018, he has served as the Deputy Chief, Strategy and Operations, in the Security Cooperation Division of U.S. Army Pacific headquarters, part of U.S. Indo-Pacific Command at Fort Shafter, Hawaii.

“For a Canadian exchange officer to be brought into this headquarters and introduced to U.S. strategy and understand the linkages between operational and strategic objectives and operational means and tactical ways to achieve those objectives is a real privilege,” he observed.

Though the Canadian Army has a presence in Asia – Army Commander Lieutenant-General Wayne Eyre recently served as deputy commander of United Nations Command in Korea – the Indo-Pacific is not the central focus of force generation and preparation. While the Royal Canadian Navy is well established on the West Coast and, together with Royal Canadian Air Force, is a regular participant in Pacific exercises and a contributor to operations – in early October, HMCS *Winnipeg* and a CP-140 *Aurora* deployed on Operation Neon to monitor UN sanctions imposed against North Korea – the Army has been more oriented toward Eastern Europe, the Middle East and Africa.

Bioletti's role is probably best understood as a form of defence diplomacy. His office is responsible for the development, coordination and integration of the policies, plans and programs that support security cooperation activities

in the Indo-Pacific.

The U.S. shares mutual defence treaties with Australia, New Zealand, Japan, the Republic of Korea, the Philippines and Thailand, and is a defence partner with others such as India, Indonesia, Malaysia and Vietnam, countries with large militaries and the financial resources to “take a larger role exporting stability,” he explained. “They are not allies but they are partners with whom we want to increase engagement.”

The Security Cooperation Division (SCD) aims to strengthen those alliances and partnerships by improving interoperability and access, building trust, and increasing partner capacity. And the force behind that will to engage is substantial – U.S. Army Pacific (USARPAC) consists of around 100,000 soldiers.

From a professional development standpoint, the position is “a fantastic learning opportunity to see how capability development works in an international setting,” he said. “You get exposure to U.S. foreign military sales; exposure to how coordination with the embassies occurs. You get to understand the priorities of various armies and their constraints and concerns. I've gained experience in security cooperation, coalition building, foreign military sales, and working with the Department of State and the Embassy teams in the region.”

The strength of the SCD is a large team of foreign area officers (FAO), a profession that rapidly expanded during the wars in Afghanistan and Iraq. Each FAO is a regionally focused expert in political-military operations and well versed in regional political dynamics and proficient in a regional language. The officers serve as program managers overseeing all security cooperation in their respective countries, working with and through embassy staff to deliver in-country programs.

“They are a conduit for information between U.S. Army Pacific and the Department of Defense working at the embassy in country,” said Bioletti.

That cooperation runs the gamut, from bilateral exercises to exchanges of subject matter experts to help build knowledge and capacity. One expert exchange involves disaster management with China. “It is the only major bilateral military engagement with China and it is run by the U.S. Army,” he observed. “It is not building Chinese capability, it is shaping their disaster management and making sure there are mechanisms so we reduce risk if ever China and the U.S. respond to a disaster.”

The Strategy and Operations branch is more the umbrella of the Division, taking a regional or theatre-wide view of all activities and initiatives. Bioletti will often represent SCD in staff functions that are not specific to a single country, where a regional initiative, for example, touches on several countries



Col R.J. Garcia, commander of the 25th Combat Aviation Brigade, hosts MGen Mochamad Fachrudin and the Indonesian Army delegation in July 2019. Photo: 1Lt Ryan DeBooy



A disaster response exercise exchange in Dhaka, Bangladesh in October 2019. Photo: USARPAC PAO

and planning requires a broader perspective. “We are coordinating efforts where we have to get several program managers to work together on a common regional initiative,” he explained.

In that role, he also serves as the lead planner for two major USARPAC working groups, Engagement Development and Security Cooperation, annual meetings to plan and prioritize funding allocation for the various country and regional initiatives. “That takes a lot of time because there are a lot of operational planning team meetings leading up to these events,” half of which are classified, he noted.

The Engagement Development working group includes allied and partner participation and can involve coordination with security cooperation equivalents from Australia, New Zealand, Japan, Korea, U.K., Canada, and the French Armed Forces in New Caledonia.

Bioletti is also involved in the management of several large, multilateral senior leader conferences each year, including the Indo-Pacific Armies Management Seminar, the Indo-Pacific Army Chiefs Conference, and USARPAC participation in the LANPAC symposium and exhibition, hosted annually by the Association of the United States Army (AUSA) in Hawaii. These conferences include bilateral meetings between army chiefs or their deputies that require a fair amount of coordination.

Sharing his acquired knowledge of the Indo-Pacific with the Canadian Army will have to wait until the three-year exchange concludes in 2021. But he is using the channels available to help inform the Director of Army Staff in Ottawa.

“I can’t send information to Canada, but since the U.S. Army is more willing to share with trusted partners, I have jumped on that and made sure we do share,” Bioletti said. “I’ve been pushing the envelope on the Engagement Development working group to maximize the amount of information we are authorized to share with allies and partners. Last year we shared classified information with Canada, the U.K., Australia, New Zealand, Japan and Korea. And this year we have been sharing all of the U.S. Army exercise concepts of operations and design for five-year plans with those partners.”

Not surprising given the overarching role of the Strategy and Operations branch, the posting can demand travel throughout the region to support bilateral executive steering groups and land force talks and ensure “bilateral activities are nested in regional objectives.” After two years of mastering the routine tasks, with duty travel to Bangladesh and Thailand in 2019, Bioletti had been scheduled to travel more in 2020. The coronavirus pandemic put a stop to that. But once COVID-19 restrictions are lifted, he expects to be on the road to meetings in Malaysia, Japan and several Pacific Island countries.

An infantry officer by trade, Bioletti was commissioned in 2005 and served in the Royal 22nd Regiment, a rarity for an anglophone officer at the time, eventually commanding a company in the 2nd Battalion. He completed tours in Bosnia, Afghanistan, the Democratic Republic of the Congo before attending the Joint Command and Staff Program at the Canadian Forces College in Toronto.

The officer exchange is a first for him and the Canadian Army. The opportunity with USARPAC opened up in 2018 and he admits he drove his career manager “crazy” trying to ensure the earliest possible start date. The fact that it meant relocating to Honolulu made it an easy sell to a more-than-enthusiastic family.

He’s jokingly played down the benefits to Canadian colleagues out of fear his next posting could be to Alert, Nunavut. But for his family, it has been a cultural experience more than anything. His daughter and son, ages 12 and 11, both attended French schools in Valcartier, Que., and are learning in English for the first time. “They have learned a lot about Hawaiian culture. They sing Hawaiian songs. My son surfs, I surf a little too. It is a cultural experience. Americans and Canadians are very similar, but Hawaii has its own Polynesian culture that is equivalent in a way to Canada’s northern people. It is a distinct culture within a larger American culture.”

The Canadian Army may not be as oriented to the Indo-Pacific as its American counterpart, but the exchange position could serve as means of building regional expertise. If nothing else, it is “essential for anybody who is interested in working in defence diplomacy in Canada, including as a defence attaché or working at an embassy or in policy. Or even in corporate Canada, in the arms industry,” said Bioletti. “The biggest advantage of this job is for professional development.”

And an officer doesn’t need to be in the role long to see how Canada could participate more in regional initiatives. Canadian niche capabilities from snipers, to forward observers and joint terminal attack controllers, precision fires, information operations, medical services, and engineering capabilities would all be of interest to regional allies and partners interested in subject matter expert exchanges.

“There are small-scale engagements where Canada can achieve leverage, especially with more niche capabilities, enabling capabilities,” he noted. There is also significant interest for demonstrations of joint approaches and capabilities. “A lot of the countries in the Pacific do not have that. They have competition between their branches. They don’t have the joint mindedness that Canada does. Demonstrating joint capabilities would be a big win for Canada. There is an appetite for that.” ■



Soldiers from the Royal Thai Army receive a class on the applications of a traction splint as part of Hanuman Guardian Exercise in March 2020. Photo: 1st Lt Angelo Mejia



A demonstration of CBRN decontamination during the Pacific Protection Symposium for USARPAC partners in August 2019. Photo: USARPAC PAO



25th Infantry Division Soldiers demonstrate the operation of the M777 Howitzer for LGen S K Saini, India Vice-Chief of Army Staff, in October 2020. Photo: USARPAC PAO



COMBAT SIMULATION

How the Army is revitalizing a critical experimentation capability

By George Nikolakakos and Maude Amyot-Bourgeois

In 1983, as movie theaters were screening the popular fictional film *WarGames*, the U.S. Lawrence Livermore National Laboratory was quietly in the process of transferring the world's first ever near-real-time, interactive combat simulation software to the U.S. Army. Named Janus, the computer wargame made it possible for two military interactors to each lead an opposing simulated Army team using private computers that were housed in separate rooms. The simulated soldiers and vehicles were displayed as icons on a two-dimensional digitized map of the battlefield and were controlled via keyboard commands.

In the ensuing years, the U.S. Army used Janus as an operational planning tool prior to both the invasion of Panama in 1989 and Operation Desert Storm which followed shortly after. U.S. Army leaders credited the Janus simulations with having saved lives.

In 1988, the Canadian Army received funding to acquire its own copy of the Janus combat

“Shall we play a game?”

– WOPR supercomputer in the 1983 film *WarGames*

simulation tool. Starting in 1990, the Army, supported by scientists from the Operational Research Division (now known as the Centre for Operational Research and Analysis (CORA)), began using Janus as a research tool to conduct experimental studies.

Janus studies typically commenced with a tabletop map-based wargame exercise which assisted in establishing the tactics and scenarios that would be implemented in the Janus software. After the scenario was designed and programmed into the Janus tool, military interactors played through the simulated battle and data such as the number of enemy forces eliminated, the number of

friendly forces lost, and the amount of ammunition used were collected. The same scenario was played out a number of times by the interactors to gather data for statistical analysis. The quantitative results generated during the simulated Janus runs were usually accompanied by observational judgement and insights provided by the military players.

Janus research studies, conducted until the tool was retired in 2004, explored a wide range of military problems including assessing the potential effectiveness of new combat systems and vehicles, analyzing alternative force structures, aiding in the development of tactical doctrine, and evaluating the potential impact of emerging new technologies. Combat simulation was unlike any other operational research method as it provided essential battlefield context that could be directly related to Army operations.

As the Canadian Army adapted to the changing nature of the conflicts that they were engaged



in, so too did the combat simulation tools used to support them. In 2004, the CORA Land Forces Operational Research Team began to use the UK Defence Science and Technology Laboratory-developed Close Action Environment (CAEn) model as a stop-gap measure. CAEn was specifically designed for conducting urban-warfare research studies that were in demand by the Army at the time. CAEn was successfully used until 2015 when the Canadian Army's research combat simulation capability was quietly shut down due to budgetary constraints. Despite continued interest from senior military personnel, the capability has remained dormant for a number of years.

With several upcoming Army equipment acquisition and upgrade projects now funded and undergoing options analysis, there is a pressure to have the research combat simulation capability restored. To that end, the Canadian Army Operational Research and Analysis Team (CA ORAT) within CORA has been exploring potential options for reinvigorating this critical capability. The recently published Defence Research and Development Canada scientific report titled, "An Examination of the Past, Present, and Future Canadian Army Tactical-Level Combat Simulation Capability," details the history of combat simulation

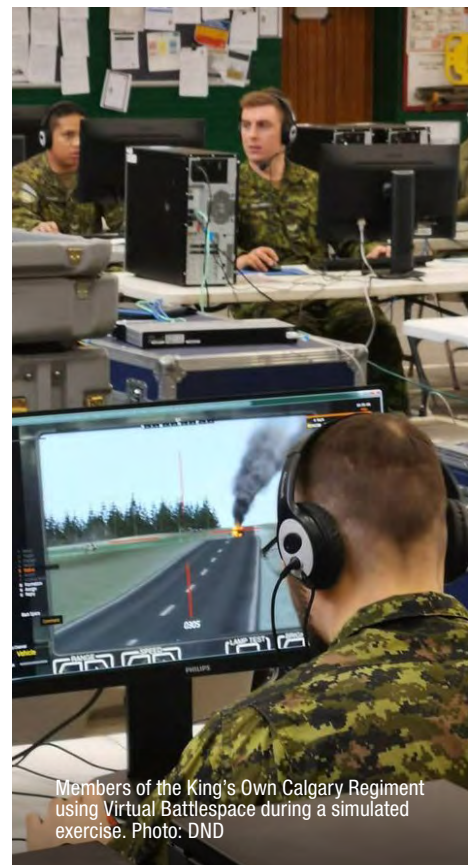
and modelling within the Army and proposes a new path forward.

The sections that follow provide a brief description of some of the research combat simulation initiatives that the team is currently undertaking. More details can be found in the full report.

CONSTRUCTIVE SIMULATION WITH ONESAF

Constructive simulation tools are elaborate computer software packages in which users control simulated people and equipment in synthetic environments. In a practical sense, this typically resembles something like a computer game version of the board game *Risk*. Users are provided with an overhead digitized map of the battlefield and moveable icons on the screen represent soldiers or vehicles. A simulation database contains detailed information about the simulated soldiers, vehicles and weapons such as their vulnerability to different types of ammunition, their range of visibility in different environmental conditions, and their movement speed over different types of terrain. Simulated combat engagements are decided based on these characteristics.

The team is currently exploring the use of the U.S. Army-developed simulation One-Semi-Automated Forces (OneSAF) for studies.



Members of the King's Own Calgary Regiment using Virtual Battlespace during a simulated exercise. Photo: DND



Two soldiers from the King's Own Calgary Regiment work with VBS simulation during Exercise King's Command 2019. Photo: DND

OneSAF is the natural evolution of past combat simulation tools such as Janus, featuring high-fidelity, physics-based models as well as a highly customizable equipment database and simulation environment.

AGENT-BASED MODELLING WITH MANA

Agent-based models (ABMs) are non-interactive constructive simulation tools. But unlike traditional high-fidelity combat simulation tools such as Janus and OneSAF, they aim to simplify the simulation process by abstracting many of the detailed physical models (e.g., the representation of terrain might be greatly simplified if it's not a critical component of the study being conducted). Simulated entities in ABMs interact with each other autonomously based only on a set of internal criteria and information about their surrounding environment and other entities. This removes the need for users to assign specific detailed behavioural decision-trees to each entity, greatly reducing setup times.

The relative simplicity and quick setup times offered by ABM tools allows for rapid generation of vast volumes of data covering a wide parametric range in the options spaces (a method termed data farming). This can include for instance incrementally increasing the range of a weapon or sensor system to evaluate the relative impact of

ranges on battlefield success. Data farming allows analysts to examine a broad spectrum of simulated outcomes in a quick and efficient way, providing important information that can be further applied to higher-fidelity combat simulation studies using more traditional tools.

The team is currently in the process of conducting experimentation and analysis using the Map Aware Non-uniform Automata (MANA) ABM tool that was developed by the New Zealand Defence Technology Agency.

VIRTUAL SIMULATION WITH VIRTUAL BATTLESPACE

Virtual simulation describes real people using simulated equipment in a simulated environment. Traditional examples include a flight simulator or a tank simulator in which computer systems and monitors represent the control panel and external view of a real vehicle. Borrowing heavily from modern first-person-shooter videogame technology, military virtual simulation tools have become increasingly immersive. The Virtual Battlespace (VBS) series is a popular virtual simulation tool that's currently used by militaries across the world, including the Canadian Armed Forces, for training and mission rehearsal.

Recent advancements to the software have also made VBS an attractive tool for conducting

experimentation and analysis. The CA ORAT experienced this first-hand in late 2019 when they participated in the UK-led Experiment Virtual Eagle, a large-scale virtual simulation experiment which consisted of approximately 180 serving U.K. military personnel conducting high-fidelity simulated battles using VBS on networked laptops.

The team is currently exploring ways of combining Canadian Army virtual simulation training exercises with experimentation objectives using VBS. This would allow for the effectiveness of different equipment options to be evaluated while simultaneously considering the relevant tactics, techniques, and procedures being employed in a simulation environment that is more immersive and directly applicable to real operations when compared to traditional constructive simulation tools.

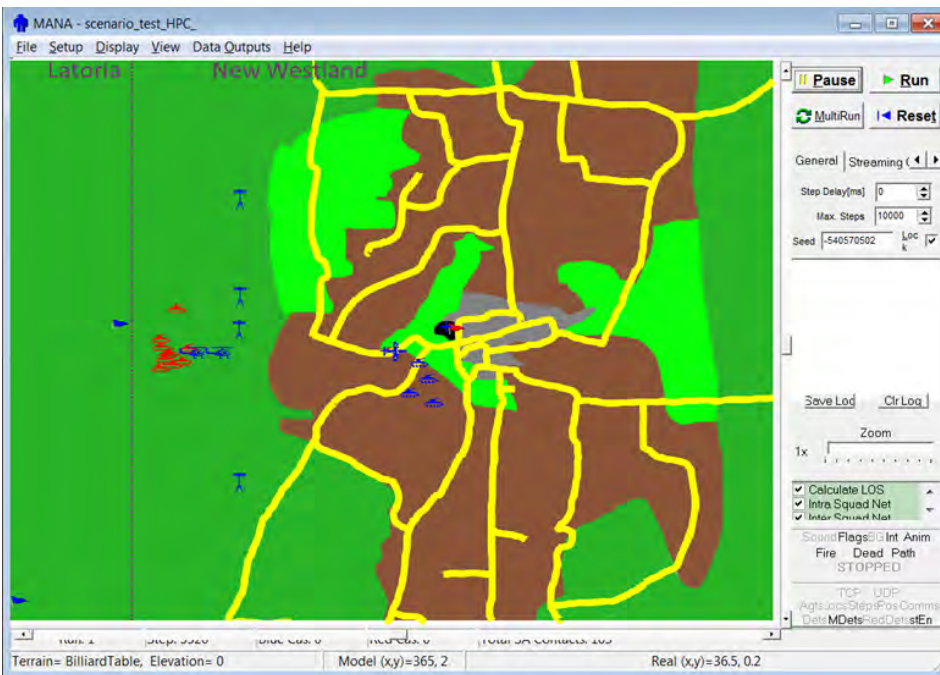
EXPLORATION OF COMMERCIAL-OFF-THE-SHELF (COTS) WARGAMES

While traditional constructive simulation tools offer an effective means for conducting experimental analysis, it's recognized that they are difficult to maintain and operate, and typically require significant set up times. Additionally, they are often visually unappealing, making it challenging for non-experts to easily interpret the simulation output.

Commercial-off-the-shelf (COTS) wargames



Canadian and British soldiers utilize an Indirect Fire Trainer during an all-arms call for fire simulation system training for Exercise Allied Spirit IV at the Joint Multinational Readiness Center in Hohenfels, Germany, in 2016. Photo: Cpl Nathan Moulton



A screen shot of the MANA model. Photo: DRDC

are recreational computer games that have been modified for analytical use. They are easier to learn and use and offer a more intuitive and visually appealing interface. Already used extensively by some allied defence agencies, the use of COTS wargames could complement other Army combat

simulation tools by providing rapid preliminary insights that could aid in guiding more detailed experimentation using traditional tools. Additionally, they could boost collaboration and improve engagement between scientific analysts and military personnel.

The team is currently in the process of examining COTS wargames such as *Command: Modern Operations* and the *Combat Missions* series to determine their potential applicability to Army studies.

Experimentation using combat simulation is currently being applied to a number of high-priority Army upgrade and acquisition projects such as the Ground-Based Air Defence project, the Anti-Tank Guided Missile Replacement project, and the Land Force Intelligence, Surveillance, Target Acquisition and Reconnaissance project. As this critical CORA capability continues to rapidly mature, it is once again being positioned at the forefront of procurement projects. And unlike in the sci-fi classic *WarGames*, the only winning move in this case is to play. ■

Dr. George Nikolakakos is an experimental physicist with Defence Research and Development Canada's Centre for Operational Research and Analysis (DRDC CORA) and a member of the Canadian Army Operational Research and Analysis Team (CA ORAT). Maude Amyot-Bourgeois is an experimental physicist in DRDC CORA and a member of the CA ORAT.



Bad Beard Breaks

Soldiers in a chemical, biological, radioactive, nuclear (CBRN) scenario on Exercise Silver Arrow in Latvia. Photo: Cpl Valerie Côté

Beards and mustaches, neatly trimmed, of course, are a common sight on Army bases from coast to coast. The 2018 Canadian Armed Forces (CAF) general order allowing facial hair and longer hair styles to flourish was a welcomed change. But with growth has come a problem for those who must wear respirators as part of their job.

“Any sort of facial stubble breaks that seal of a gas mask,” said Chris Ste-Croix, business development manager with HumanSystems Incorporated (HSI). “There are some respirators on the market today that offer some limited protection, but they don’t meet the minimum standard for wearing a mask over a prolonged period of time.”

Eye glasses, differing face shapes, even firing a weapon or performing other operational tasks – all can cause micro-breaks in a seal. But beards are proving to be a particular problem.

Under a challenge issued by the Innovation for Defence Excellence and Security (IDEaS) program, HSI is developing a respirator that could solve that problem. In September, the Guelph, Ont., company was awarded \$1 million for 12 months to continue its development of a respirator, called Citadel, designed to better protect soldiers in hazardous chemical, biological, radiological or nuclear (CBRN) environments.

The patent is still pending, but the Citadel offers a “low-weight” design that overcomes some of the problems with large canisters and batteries,

and combines a mask, hood, blower and other components “that work together to provide a defence against contaminants entering the mask,” Ste-Croix explained.

The challenge called for a respirator compatible with soldier and CBRN clothing and durable to handle a range of work postures over a prolonged period in demanding environments. “We believe our system has the answers to all those and, hopefully, by the end of the project we’ll be able to prove that,” he said.

Initial testing in HSI’s lab “to measure how much particulate gets into the mask” has shown the proof-of-concept Citadel to have a fit factor for those with beards at least two times above acceptable standards; clean shaven test subjects achieved a fit factor three times better. The goal now is to begin prototype testing in an operational environment by the end of the year.

HSI, a human-factors consulting firm, has held standing offers with Defence Research and Development Canada (DRDC) for at least 20 years, and has been involved in numerous soldier projects such as Soldier Integrated Precision Effects Systems, Future Small Arms Research, and Integrated Soldier Systems. The company has also done research into user needs related to CBRN, including integration with existing equipment and anthropometry.

The decision to branch into product development, though, was motivated by IDEaS.

“Without this challenge we probably wouldn’t have gone down this road,” Ste-Croix admitted. “We have rarely done product development in the past. But we saw this and, based on our experience, we thought we could have some innovative ideas. Being able to help better protect our troops was very compelling to us.”

The relatively rapid acceptance and development cycle of IDEaS is also attractive to small businesses, Ste-Croix suggested, a noticeable difference from the normal defence acquisition cycle. “It is allowing industry to come up with these innovative solutions a lot faster than you would typically see,” he observed. “This is building on programs in other countries.”

HSI received \$200,000 for six months in a first round of funding to develop its idea to around Technology Readiness Level 6. With the additional \$1 million, the hope is to see the Citadel design mature in realistic operational testing to a point where it can begin a third phase, innovation assessment implementation.

“We would like to keep on going with the IDEaS program as far as we can,” said Ste-Croix. “Our intent is for the CAF or defence industry to be our first buyer.”

However, product development began before a global pandemic highlighted the need for well-fitted masks, so the company can foresee a dual-use technology applicable to numerous other operators and first responders that require respirators. ■



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