CANSEC SHOW DAILY

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WEDNESDAY, 27 MAY 2015

Strengthened backbone

General Dynamics Land Systems-Canada (GDLS-Canada) is displaying the newly upgraded variant of its venerable LAV III 8x8 infantry fighting vehicle at CANSEC 2015 – the all-Canadian-designed LAV 6.0.

The company was awarded a CAD1.06 billion contract in October 2011 to upgrade 550 Canadian Army LAV IIIs in four variants: infantry section carrier, command post, observation post and engineer vehicle. The deal was later modified with a CAD151 million contract in September 2012 to provide for an additional 66 Reconnaissance variants.

These vehicles will undergo a comprehensive upgrade under the LAV III Upgrade Project aimed at extending their service life through to 2035. The upgrades will be performed at facilities in London, Ontario, and Edmonton, Alberta, through to 2017. To date, more than 60 LAV 6.0 vehicles have been delivered to the army.

Since the LAV III entered service in 1997, it has been the 'backbone' of the Canadian Army's armoured vehicle fleet. "The new LAV 6.0 represents the gold standard in light armour capability; we are proud to provide the world's best light armoured vehicle," said Doug Wilson-Hodge, corporate affairs manager at GDLS-Canada.

Survivability enhancements include a new double-V hull for additional protection against mine and IED threats and energy-attenuating seats at all crew locations; the add-on armour package developed for the LAV III is retained. A more powerful 450hp engine replaces the LAV III standard 350hp, along with upgrades to the drivetrain and suspension. A digital fire control system (FCS) with backdrive that automatically corrects for target range and crossing speed replaces the earlier stabilised FCS, while the turret thermal sight and image intensification sight have been upgraded to extend their range and the gun control electronics are being improved.

The fully upgraded gross vehicle weight is 62,000 lb (28,125kg) compared with 42,000 lb (19,050kg) for the LAV III; however, GDLS-Canada said testing has demonstrated that the 6.0 mobility is comparable to or better than that of the original 42,000 lb GVW LAV III platform.

Wilson-Hodge confirmed that GDLS-Canada is positioning the LAV 6.0 for international competition, including, potentially, the UK Ministry of Defence's Utility Vehicle requirement, and plans to show it at DSEI 2015 in the UK in September. The company is also partnering with Thales to offer an 8x8 vehicle for the Australian Department of Defence's Land 400 Land Combat Vehicle System requirement.

General Dynamics Land Systems-Canada is showing off its battlefield MRV (maintenance recovery vehicle) variant of the LAV in the outside display

DAY 1

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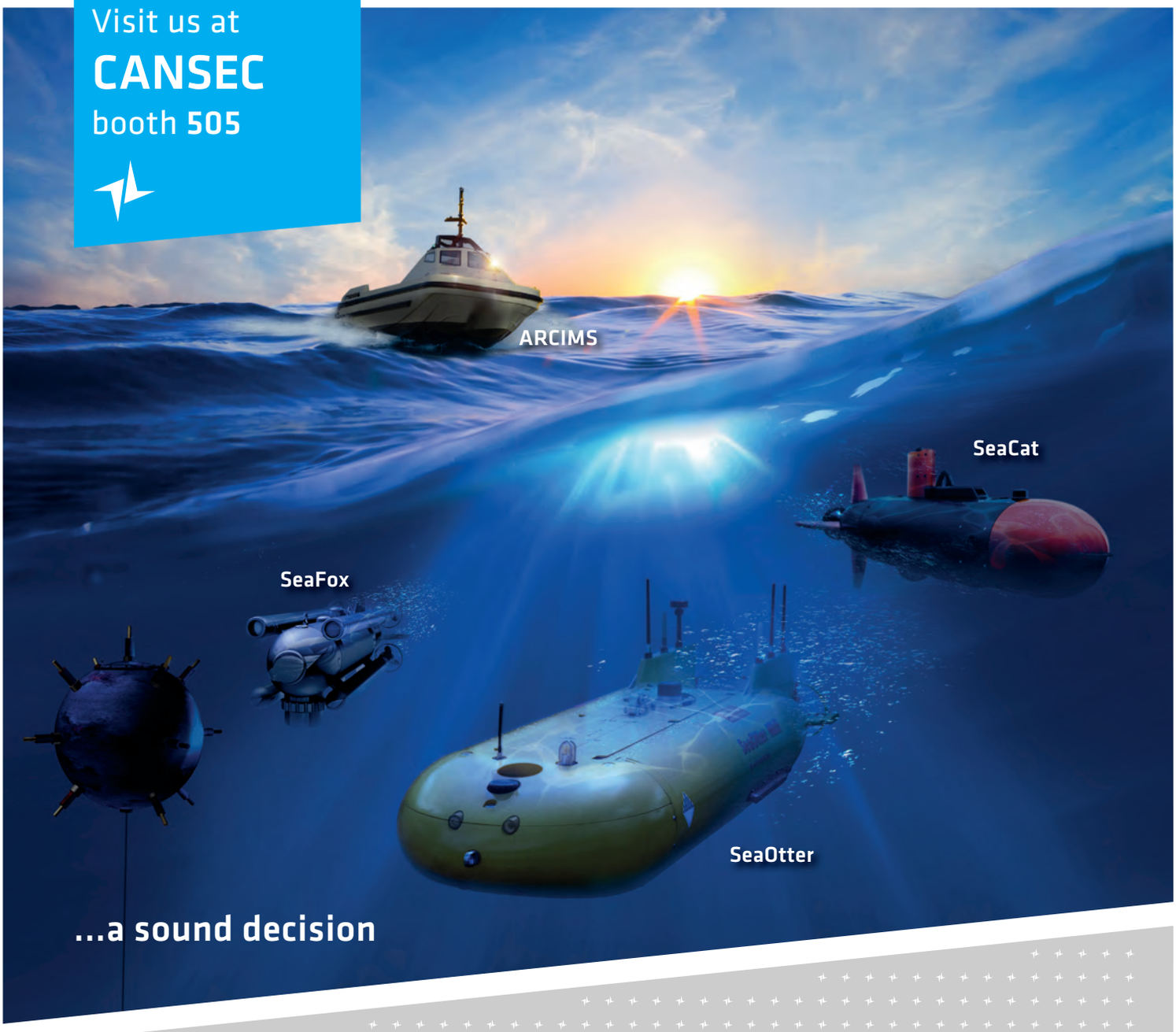

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Sentry breaks cover

ROBIN HUGHES

Toronto-based INKAS Armoured Vehicle Manufacturing (Booth 2201) has unveiled the latest in its family of multipurpose armoured personnel carriers: Sentry, a new 4x4 armoured personnel carrier (APC) designed for service with military and SWAT-type forces, and other law enforcement agencies.

Featuring a six-speed automatic transmission and 151-litre fuel capacity, Sentry is powered by a 6.7-litre V8 turbocharged diesel engine delivering 362hp at 4,750rpm, and can accommodate up to eight passengers and crew.

Built on a heavy-duty truck chassis, the new APC has a high level of off-road performance and manoeuvrability, and is designed to operate in diverse climatic conditions.

Sentry is constructed with dual protective layers, ensuring the safety of its occupants from ballistic as well as blast attacks. Advanced armouring materials provide protection against 7.62×51 SC ammunition, 7.62×51 M80 NATO Ball ammunition and meet NIJ-STD-0108.01 Level III as well as CEN Level BR7 ballistic standards.

The Sentry 4x4 vehicle is the latest in the INKAS family of multipurpose armoured personnel carriers

The vehicle features perimeter armouring of the passenger compartment and engine bay as well as important mechanical components. The vehicle is equipped with multilayer ballistic glass and INKAS' proprietary overlap system to protect against bullets being shot between the seams of doors.

Additional security features include an escape hatch, siren/PA system, emergency lights package and electronic military system, as well as external view cameras providing a 360° field of view. The vehicle can also be customised to serve as a mobile command centre or a medical evacuation vehicle.

Sentry has been fully designed, engineered and built at the INKAS manufacturing facility in Toronto, Canada. In 2014, INKAS relocated its production capacities from the UAE to Canada in order to centralise its operations for both the military and civil markets.

DAVID DONALD

Long-term partner

Boeing has been a major supplier to the Canadian forces for many years, the partnership having been established in 1919. For the air force, in particular, Boeing has been a key supplier, the most recent acquisition being the delivery of a fifth C-17 Globemaster III transport in March.

The importance of Canada to Boeing is considerable, forming a large part of the international supplier network. More than USD4.5 billion of industrial and regional benefit programmes have been completed, and a further USD4.6 billion are currently under negotiation. More than USD1 billion of economic benefit is generated in Canada annually.

Here at CANSEC, the company is promoting a wide array of products that have particular relevance to the Canadian market, including the F/A-18 Super Hornet, which the company views as an ideal solution to the multirole fighter requirement.

Boeing (Booth 1821) is one of four manufacturers – along with Dassault, Eurofighter and Lockheed Martin – that has indicated that it would respond to a competitive request. The company believes the Super Hornet is an ideal replacement, citing both low acquisition/operating costs and multirole capability. Familiarity with the first-generation Hornets already in service is also seen as a positive.

Canada continues to fund its industrial participation in the Lockheed Martin F-35 programme, which until 2012 was planned to result in a 65-aircraft order. That is in effect on hold while the fighter acquisition strategy is being re-evaluated. The need to fulfil the fighter requirement has been delayed, thanks to an extension programme for the country's existing F/A-18 legacy Hornet fleet that should take them through to 2025. As a consequence, it might be possible that only the Lockheed Martin F-35 remains in production at that time.

Boeing's Super Hornet is being pitched to Canada as an alternative to the F-35

Boeing has stated that the Super Hornet already has orders to 2017, and is expecting new orders from the US DoD. The company is hoping that the aircraft can remain in unbroken production until at least 2020.

Another system being highlighted here is the Maritime Surveillance Aircraft. This employs a Boeing mission system that is based on one developed for the US Navy's P-8 Poseidon, but sized for the Bombardier Challenger aircraft. Boeing is working closely with Canada's Field Aviation to design and implement the airframe modifications and system installation.

Satellite communications is also regarded as an area in which Canada has requirements, and Boeing is highlighting its relevant expertise. The company is also promoting the RQ-21 Blackjack (formerly Integrator) STUAS (small tactical unmanned air system) from the Insitu subsidiary. The Blackjack uses the same launch and recovery system as the highly successful Scan Eagle UAS, and can be used both on land and at sea. It saw its first operational service around a year ago when deployed by the US Marine Corps to Afghanistan.

An RQ-21A Blackjack is ready for launch aboard a US Navy vessel

French expertise at sea

FNS *Normandie* was the second vessel from the FREMM class, but has been diverted to fulfil an urgent Egyptian navy order

In 2014, French naval defence company DCNS established a wholly owned subsidiary in Canada to support its proposals for local naval requirements, including the development of engineering and industrial partnerships with Canadian industry. DCNS Technologies Canada (Booth 1428) is supporting the company's bids to secure two large contracts, including the Canadian Surface Combatant (CSC) requirement.

Under the national ship-building procurement strategy, the CSC programme is to procure a single class of vessels to replace the Iroquois and Halifax classes. DCNS is proposing its FREMM frigate as a basis for the Canadian requirement, to be built locally and adapted to meet Royal Canadian Navy (RCN) specifications. The company bases its proposal on sharing its extensive experience as a combat system integrator and whole warship integrator with local industries.

France has ordered 11 FREMM multimission vessels, of which two will be dedicated to area air and missile defence. These vessels could become part of the future NATO ballistic missile defence architecture, in which DCNS is involved. France's first FREMM frigate, FNS *Aquitaine*, recently took part in NATO's Joint Warrior exercise, alongside RCN vessels.

Another first for the FREMM occurred last week when *Aquitaine* fired an MBDA MdCN naval cruise missile, marking the first time this class of weapon had been fired by a European surface vessel. MdCN (missile de croisière naval) has been developed from the air-launched Storm Shadow/Scalp EG weapon. The 19 May cruise missile test followed a successful launch on 12 May of an MM40 Exocet anti-ship weapon. The tests represented further milestones in the campaign to clear FREMM for service, following firings of the Aster 15 anti-aircraft missile in 2013, and the clearance of the vessel's NH90 helicopter to drop the MU 90 lightweight torpedo.

DCNS is also positioning itself for participation in Canada's AJISS programme for the in-service support of future Arctic/Offshore Patrol Ships and Joint Support Ships. DCNS offers a wide range of support services, from spare parts ordering to through-life fleet support. It provides life-extension and modification programmes for existing vessels, training for naval and industrial personnel, and shipyard development support.

Here at CANSEC, DCNS is also showcasing some key technologies, including the SETIS integrated combat management system, which brings together sensors, weapons and communication systems into a single system. It is used by the FREMM class and has been selected for the corvettes ordered by the Royal Malaysian Navy and the Egyptian Navy.

Another system in the spotlight is the Canto anti-torpedo defence system, which uses the confusion and dilution concept. DCNS claims it is the only system capable of protecting vessels from state-of-the-art threats and older generations of torpedoes. DCNS offers the Canto-V system for surface vessels and the Canto-S for submarines.

Many of these technologies are incorporated in the company's XWind 4000 concept vessel design. Technical innovations from DCNS that will be available in the near to medium term are brought together into a single vessel design. The 'all-digital' vessel combines features such as integrated flat-panel arrays around the superstructure to provide hemispherical coverage for sensors, communications and countermeasures.

The vessel's unmanned vehicles are fully integrated into the combat system, in effect extending the reach of the ship's sensor suite. Intuitive user interfaces are included in the new-generation operations centre and combat bridge. The XWind 4000 concept also employs a hybrid propulsion system.

The MdCN cruise missile being fired from FNS *Aquitaine*

DAVID DONALD

One of the most important programmes for the Canadian Forces is the FWSAR (Fixed-Wing Search And Rescue) requirement to replace the de Havilland Canada CC-115 Buffalo in the SAR role and to relieve the Lockheed CC-130 Hercules of its SAR commitments. There is also a secondary transport requirement.

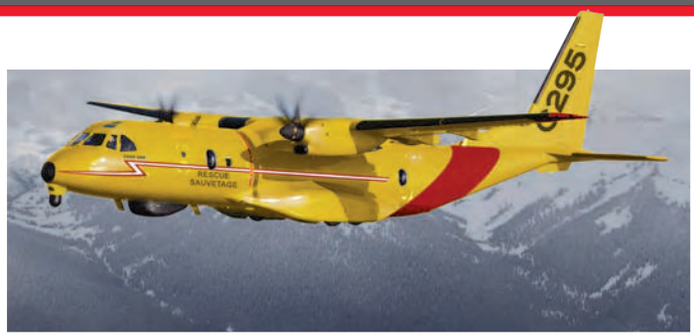
Having been given a high priority several times over the years, only to be delayed, FWSAR is back on the agenda and a new request for proposals was issued at the end of March. The deadline for proposals is 28 September, and now it is over to industry. An evaluation is expected to be completed after about six months, with the aim of reaching a decision some time next spring.

At one time there were at least six companies interested in bidding for the FWSAR contract, but now that is down to an expected three, comprising Team Spartan offering the Alenia C-27J; the Canadian Team proposing the Airbus Defence and Space C295; and Lockheed Martin offering the HC-130J.

Lightweight Car

Saab is presenting the Carl-Gustaf M4 for the first time at the CANSEC show. Unveiled at the AUSA show last year, the latest version of the highly popular

Teams line up for FWSAR



Airbus Defence and Space C295 (above); Lockheed Martin HC-130J in US Coast Guard service (left); Alenia Aermacchi C-27J Spartan (below)

Team Spartan brings together airframer Alenia Aermacchi, General Dynamics Canada and training/simulation specialist DRS Technologies Canada as the principal partners. The C-27J offers a proven, rugged airframe with good short/rough field performance, long range and fast dash speed. The latter attribute is seen as particularly valuable to Canada's unique SAR requirement to cover a vast area from only a few bases.

Airbus is highlighting the low operating costs of the C295, among other benefits, and also the heavy Canadian content of its proposal. Airbus has partnered with Provincial Aerospace as primary local partner for the integration and installation of systems specific to the Canadian requirement, plus in-service support. Pratt & Whitney Canada supplies the C295's PW127G engines, and CAE has been selected as the training and simulator partner.

Although the baseline C295 aircraft is a transport, Airbus Defence and Space has developed and delivered a number of special-purpose versions, including those for long-range maritime patrol.

Lockheed Martin's HC-130J offers the longest range and largest load capability of the three. Canada currently uses the older-generation version of the Hercules for long-range patrol, and also employs the new-generation CC-130J transport version, providing a high measure of commonality with an FWSAR variant. Lockheed Martin has partnered with Cascade Aerospace for the FWSAR proposal, the company having provided support to the CC-130 fleet since 2005.

Both the HC-130J and the C-27J are in use with the US Coast Guard on search and rescue duties, the service having recently taken delivery of the first of 14 C-27J aircraft that were surplus to Air Force requirements. At the same time, the US Coast Guard also flies the HC-144 Ocean Sentry, a version of the Airbus CN235 – a smaller sibling of the C295.

arl-Gustaf comes to Canada

shoulder-launched weapon system is shorter and lighter than its predecessor, while introducing new features that make it compatible with future battlefield sighting technology.

Compared with its M3 predecessor, the Carl-Gustaf M4 is smaller, with a length of less than a metre. Saab (Booth 1521) has also made it more than 3kg lighter, with a new weight of less than 7kg. That equates to less burden on the soldier, and greater agility.

The new weapon is compatible with all existing Carl-Gustaf rounds, which cover a wide array of anti-armour, anti-structure, anti-personnel and support applications. Importantly, the new version of the system is compatible with future intelligent sighting systems, such as those that provide for programmable ammunition.

Other improvements include better ergonomics with adjustable shoulder rest and front grip. The weapon can also be carried in a loaded state, reducing reaction time. It includes an integrated shot-counter that aids logistics and maintenance schedules.

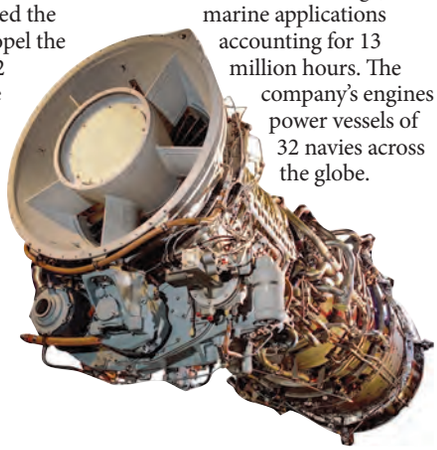
Power for the navy

DAVID DONALD

Propelling warships at high speed requires special engines. General Electric (Booth 1721) produces a range of marine propulsion systems based on aero-derivative gas turbines to suit an array of power requirements. GE's marine turbines span the power range from 4.5MW to 52MW.

General Electric supplied the LM2500 turbines that propel the Royal Canadian Navy's 12 Halifax-class frigates. The company also provides 24/7 maintenance and logistics support for the engines, including repair and overhaul, engineering support, parts warehousing and inventory management, spare engine and component supply, field service representatives, operational level maintenance, configuration management and technical manuals. In addition, General Electric supports the RCN's naval engineering school training curriculum for on-engine and equipment maintenance.

GE's gas turbine fleet has amassed more than 85 million operating hours across both industrial and marine usage, with marine applications accounting for 13 million hours. The company's engines power vessels of 32 navies across the globe.



Training for Canada

DAVID DONALD

Training and simulation specialist CAE has announced that its comprehensive suite of CH-147F Chinook training devices has been accepted for service at CFB Petawawa.

Elements of the full suite have already begun operation, but now the full suite is ready to go live. Included in the system are a full-motion, full-mission weapon system trainer, a fixed tactical flight training device, and a portable flight training device housed in a Weatherhaven shelter, which can be deployed to theatre to provide mission rehearsal and other support.

Installation of this advanced system is the latest in a long series of training and operational support systems implemented by CAE for the Canadian Forces. The company is active at 13 locations

The CH-147F training system uses CAE's Medallion synthetic image generation (above); CP-140 Aurora front-end trainer (left)

across the nation, as well as being a valued thought-leader in terms of driving national training strategies. Among these is an integrated simulation strategy for the air force slated for the 2025 timeframe. The company is an integral component of realising the 2025 vision, which seeks to provide an integrated, networked, force-wide simulator environment using a common database.

CAE (Booths 1611 and 3301) is heavily involved in RCAF training, including the management of the air mobility simulation centre at Trenton, and that for tactical aviation at Petawawa. It also provides rear-crew training elements for the CH-148 Cyclone and CP-140 Aurora. The latter has been particularly busy preparing crews for missions in Iraq.

Earlier this year, CAE announced the acquisition of the NATO Flying Training in Canada (NFTC) school, which employs T-6 and Hawk aircraft to augment ground-based training aids in producing aircrew for Canada and other NATO nations. For CAE, the acquisition of NFTC provides a springboard for future growth into live training to complement its synthetic training expertise. Customers are increasingly looking for complete training programmes, and the addition of live-training expertise places CAE ideally to bid for comprehensive training system requirements.

There are a number of such opportunities coming up here in Canada. In 2027, the Future Pilot Training (FPT) programme is due to begin as a 20-year contract that unites the fast-jet (currently NFTC) and multi-engine/rotary (CFTS) programmes into a single integrated system. In the meantime, an iFPT interim programme is scheduled to run from 2021 until the full FPT begins to cover a gap in fast-jet training capacity.

CAE is also well positioned to explore opportunities for live training ranges for the next-generation fighter. In the ever-growing virtual training regime, it is pursuing business associated with operational weapon systems trainers, the next-generation fighter and the Fixed-Wing Search And Rescue requirement.

CAE's traditional expertise has been in the air domain, in which it currently trains about 120,000 pilots every year across the civil and military worlds. Having gained considerable experience in aviation training, the company is increasingly applying its skills and knowledge to army and navy support, and into the public safety sector. It is promoting its capabilities as a training systems provider and integrator for programmes such as the Canadian Surface Combatant and the Land Vehicle Crew Training System for the army, which is required from around 2020.

Primarily as a result of acquisitions, CAE's capabilities also include a range of operational systems and support, mainly in Canada. The company is bidding for work in a variety of operational areas, such as electronic warfare modernisation programmes for the army.

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Visualisation reaches a new level

ROBIN HUGHES

Ottawa-based Kongsberg Gallium has developed a safety display technology designed to expand the capabilities of unmanned aerial vehicles (UAVs) in ordinary commercial use.

Kongsberg Gallium provides the geospatial visualisation technology used in several large military drone programmes, and has created a software platform that can give UAV operators working at ranges beyond visual line of sight (BLOS) the same level of spatial awareness they would have when piloting a light plane visually – what pilots refer to as "visual flight rules". Providing real-time awareness of other aircraft, airspace and terrain will be critical to allowing UAV operators to gain regulatory approval to conduct commercial operations beyond line of sight.

Development of the technology was partially funded by a federal research grant through the National Research Council of Canada Industrial Research Assistance Program (NRC-IRAP). Kongsberg Gallium will be conducting demonstrations of the display platform in a series of flights throughout the second half of the year using a long-range UAV manufactured by Brican Flight Systems of Brampton, Ontario.

Kongsberg Gallium (Booth 1731) has also released a new version of its vehicle Integrated Command System (ICS) platform, which now allows armoured vehicle commanders to scout surrounding battlefield terrain with lightweight UAVs. ICS is a software system in use within NATO that links all of the sensors and systems in an armoured fighting vehicle using the open Data Distribution Service standard.

The ICS platform provides vehicle commanders with battlefield situational awareness, warning of immediate threats and reports on the condition of the vehicle, and provides a way to control and interact with all the vehicle's sensors and systems.

Kongsberg Gallium has recently added integration for the PD-100 Black Hornet UAV developed by ProxDynamics of Norway. Integration of the Black Hornet system allows vehicle commanders to scout ahead of the vehicle for potential threats, ambushes or obstacles without risking the vehicle and crew. The system could be deployed in NATO fighting vehicles as early as 2016.

Separately, Kongsberg Gallium has entered into a strategic partnership with Critical Software of Portugal to address the Search and Rescue Mission Management System requirements of the Royal Canadian Air Force's (RCAF's) Search and Rescue Mission Management Program.

BLOS will deliver high-level spatial awareness for commercial UAV operators

The two companies will leverage their experience in the delivery of complex, integrated solutions to provide the RCAF with advanced planning, command and control and post-mission analysis via an intuitive platform that has been successfully deployed with a number of international search and rescue customers.

Kongsberg Gallium said the team's unparalleled domain experience will reduce programme risk through the delivery of proven, commercial off-the-shelf components. The flexible and open, modular, 'system of systems' approach will facilitate the incorporation of additional sensory inputs and software modules to future-proof the resulting solution.

The ICS platform allows vehicle commanders to scout the battlefield with lightweight UAVs

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Photography courtesy of The Canadian Forces Combat Camera

Made in Canada

Rockwell Collins is reaffirming its commitment to Canada by bringing a wide spectrum of its best technologies to CANSEC 2015.

"Rockwell Collins is an innovative systems provider with deep roots in Canada's manufacturing base," said Lee Obst, vice president and managing director of Rockwell Collins Canada. "Our commitment to the region has led Rockwell Collins to not only be a technology provider to the Canadian military, but we're also exporting 'made in Canada' solutions to allied countries."

Attendees are invited to the company's exhibit (Booth 1103) to get hands-on experience with the latest military technologies, starting on Wednesday with a Live, Virtual, Constructive (LVC) close air support simulation exercise, when a joint terminal attack controller working in the booth will guide an L-29 aircraft flying over Iowa during the exercise.

Visitors will also get the chance to participate in a virtual close air support mission using the RealFires transportable trainer and Oculus Rift glasses.

In addition, the Rockwell Collins TruNet networked communications system will make its Canada debut. TruNet is the first software-defined network communications solution – including ground, airborne and handheld radios, advanced networking waveforms, apps, ancillaries and services – to ensure secure connectivity between ground and airborne elements.

Other highlights include the company's proven Wideband HF, which can securely transmit high bandwidth voice, data and video in extreme environmental conditions across continents; SubNet Relay, a networking communication system with a fully masterless architecture and dynamic relay capabilities; Pro Line Fusion integrated avionics system; HeliSure flight situational awareness solution, which includes the Helicopter Synthetic Vision System and Helicopter Terrain Awareness and Warning System, selected by AgustaWestland for the AW149, AW189, AW101 and AW169 platforms; 721S Fixed Site VHF-UHF Radio Transceiver, TacNet Tactical Radio and Remote Secure Receiver; and the CORE Instructor Operator Station (IOS). During the LVC events, the CORE IOS integrated with an EP-8000 image generator will demonstrate a high-performance fast jet application.

Rockwell Collins' 721S radio has been selected by the Royal Canadian Navy

TruNet is the first software-defined network communications system to ensure secure connectivity between ground and airborne elements

Wideband High Frequency selected

Rockwell Collins' Wideband High Frequency (WBHF) communication technology, developed at its Ottawa operations, has been selected for the Build in Canada Innovation Program (BCIP). The BCIP aims to help companies in Canada to bridge the pre-commercialisation gap by procuring and testing late stage innovative capabilities within an appropriate federal government department before taking them to market.

Feedback from four weeks of tests and evaluation of the WBHF technology in March 2015 by the Department of National Defence (DND) is said to have been positive and the continued collaboration between Rockwell Collins and the DND outstanding. When fielded, WBHF provides a reliable and affordable beyond-line-of-sight communications solution with up to 240kbps of data throughput. The technology is used by the military, search and rescue organisations, mining industry and in remote communities.

RCN gets improved communications

The Royal Canadian Navy (RCN) is the latest military force to acquire the Rockwell Collins 721S radio for naval operations.

"The 85 radios, delivered on time and on budget, will enable the RCN to fit their main combatants and allow them to take full advantage of the wideband data throughput of their SNR systems," said Alan Prowse, vice president and managing director for the Americas at Rockwell Collins. "The RCN is a strong supporter and early adopter of the Canadian-developed SNR capability, which is now fielded internationally."

The 721S, a drop-in, software-defined radio replacement for the legacy Rockwell Collins AN/GRC-171 communications system, requires only five minutes to install, weighs 60 per cent less than its predecessor and offers vastly improved capabilities. It is designed and tested to operate with SubNet Relay at data rates as high as 2Mbps in a 500kHz channel.

Fully interoperable with legacy radios in use by coalition forces, the 721S includes a new remote control feature that allows customers to upgrade their installations for 'lights out' operation, reducing manpower needs. The radio also features Rockwell Collins' patented Clarity technology, which eliminates background noise in transmit and receive modes.

Investing in the future

StandardAero (Booth 1921) is making multimillion dollar investments at its component repair facilities in Winnipeg, Canada, and adding significant capabilities to its thriving aircraft parts plating line.

As a result of these investments, StandardAero will provide additional stripping and plating processes for chrome, electroless nickel, sulfamate nickel (hard and soft), cadmium (bright and non-bright), silver, copper and tin plating for aerospace parts. These plating capabilities are essential to repair aircraft components, and the company will use the facilities for its own customers as well as others in the industry.

In addition, StandardAero is increasing the size of its Winnipeg facility, adding tanks, optimising product flow, using monitoring systems for improved process control and installing a dedicated R&D line. The expansion and improvements are expected to be complete by September. The Winnipeg shop will support other StandardAero and customer MRO facilities around the world.

In addition to investing in facilities, StandardAero recently acquired DutchAero Services (DAS) from GE/Avio and will take over its existing operations to establish a European support centre providing military MRO services for Pratt & Whitney F100 and future F135 engines. The company already overhauls the T56 and AE2100 military transport engines. DAS will be branded as StandardAero Defense Services Europe and align with the company's portfolio of defence services located in San Antonio, Texas, and Winnipeg, Canada.

DAS, located at Woensdrecht Air Base in the Netherlands, will become StandardAero's second MRO operation in the country and will serve as a partner in a public private partnership for the maintenance needs of the Royal Netherlands Air Force, as well as other military operators worldwide.

A Dubai Aerospace Enterprise company, StandardAero, founded in 1911, provides a global service network of 13 primary facilities in the USA, Canada, Europe, Singapore and Australia.

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Never lose another aircraft

Recent high-profile airline disasters have raised questions regarding how the international aviation community can improve its ability to quickly locate an aircraft after an accident and, importantly, recover the vital 'black box' recorders, especially in crashes over water and in remote regions of the planet.

Already used in military aircraft around the world, as well as in commercial helicopter fleets in the North Sea, and designed to survive powerful impacts on land or at sea, the DRS Technologies Deployable Flight Incident Recorder Set (DFIRS) is now also strongly targeted at commercial aircraft fleets, providing redundancy now mandated by the International Civil Aviation Organization.

The DFIRS, which comprises a flight data recorder and 243MHz emergency locator transmitter (ELT), is designed to break away from an aircraft after it impacts land or water – and floats. Upon ejection, it immediately transmits its location and the identification of the aircraft via search and rescue satellite systems, acting as a homing signal for rescue crews.

MFoCS provides modular computing for military vehicles and weapons platforms

This facilitates recovery of the embedded flight data recorder for same-day analysis. The technology also has the potential to save lives and expense by avoiding lengthy search and rescue operations.

Arlington, Virginia, USA-based DRS Technologies (Booth 1511), a wholly owned subsidiary of Finmeccanica, is also presenting its Mounted Family of Computing Systems, which integrates existing Force XXI Battle Command Brigade and Below future Joint Battle Command-Platform and Warfighter Information Network-Tactical capability into a powerful, modular hardware architecture.

DFIRS set comprising a flight data recorder and emergency locator transmitter

In the naval market, DRS is promoting its SHINCOM 3100 all-digital secure voice system, which integrates shipboard tactical and administrative, as well as voice and data communications. The system architecture ensures complete end-to-end Red/Black separation through all communication paths, meeting all TEMPEST requirements.

DRS's Hybrid Electric Drive motors can provide significant fuel and maintenance cost savings, along with operational flexibility, when incorporated into a ship propulsion system. At low speeds, the motors allow naval gas turbine-powered ships to take the gas turbines offline and rely on smaller turbine generators for propulsion and power. DRS has been contracted by the Republic of Korea Navy to install the technology on its next-generation frigates.

Embedded training

With a rising number of defence agencies experiencing a reduction in total force size, training efficiencies continue to grow in importance. Meggitt Training Systems (Booth 414) will demonstrate the latest innovations in embedded training systems.

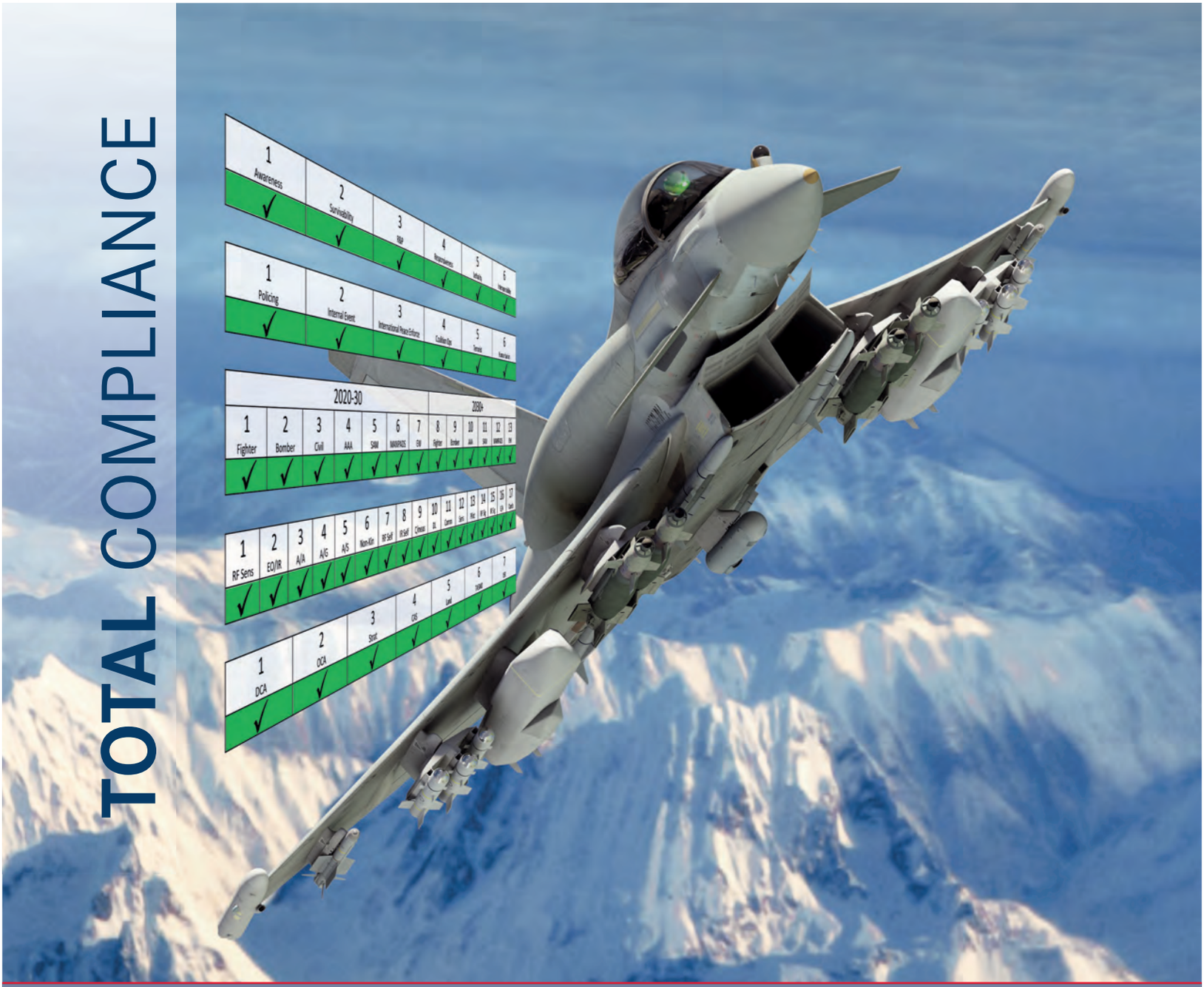
"With defence forces deploying worldwide, often with limited training facilities and resources, Meggitt has addressed the need for low power, small footprint, agile simulation solutions for mobile environments," said Paul Romeo, director of business development, Meggitt Training Systems, Quebec.

The embedded training software provides simultaneous training with multiple networked embedded systems. It allows the weapons station operator to safely practise skills and drills in a simulated environment, while providing automated performance monitoring and feedback. It serves as a gunnery and weapons station trainer, or a collective crew trainer, providing simulation and customised exercises.

Installing training devices on board vehicles allows soldiers to sharpen their combat skills during periods of downtime. Meggitt's US Army Stryker embedded trainer allows crews to conduct precision-gunnery, driver and commander tactical training.

Meggitt will also discuss applications in numerous weapon systems, including main battle tank and armoured fighting vehicle main armaments, remote weapons stations, secondary weapon systems and anti-tank guided missiles.

TOTAL COMPLIANCE



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Eurofighter Typhoon

Effective Proven Trusted

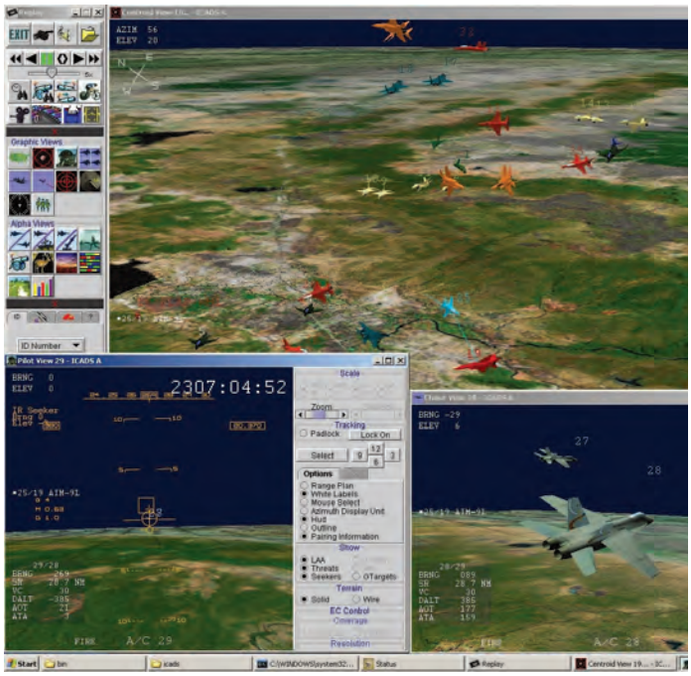
Virtual training for the military

Cubic Global Defense (Booth 1231), a business of Cubic Corporation, will demonstrate the latest innovations in game-based training technologies for improved military readiness and education capabilities here at CANSEC 2015.

"Cubic is at the forefront of what's next in game-based virtual training for the military because it provides cost-efficient, effective and realistic learning scenarios," said Martin Munro, general manager, Cubic Field Services Canada. "Our presence at CANSEC is an opportunity to share Cubic's leading innovations in virtual military training to those in the Canadian defence industry."

Some of the next-generation training technologies and products to be exhibited include the Aviation Operator and Maintainer, a maintenance procedures trainer demonstrating the inspection of wheels/tyres and the identification of faulty or damaged gear; and Maritime Courseware, which teaches maintenance personnel in a virtual environment how to align and start a potable water pump, as well as to identify faults and hazards within a ship's space in accordance with accepted procedure and good watch-standing principles for proper repairs.

Also highlighted is the Micro, Mobile, Modular-Secure Enclave (M3-SE), a small, secure and man-portable networking communications system by Cubic subsidiary DTECH Labs, which provides a wide range of capability modules, supporting everything from standard routing and switching functions to server applications, radio cross-banding,



ISDN, NSA-approved Algorithm Suite B Wi-Fi and 3G/4G wireless. ACMI-ICADS is a two-on-the-ground, portable display and debriefing system used by aircrew to replay their missions on the Individual Combat Aircrew Display System (ICADS). The Air Combat Manoeuvring Instrumentation system can combine different data sources and display training missions onto the ICADS windows for live monitoring and replay.

Honour for Canadian supplier

Hamilton-based Fellfab was one of 14 global suppliers, and a university, to be awarded a 2014 Supplier of the Year award by Boeing. The company manufactures cabin curtains for all Boeing Commercial Aircraft programmes, including spares.

The award is made based on various criteria, such as product quality, on-time delivery, post-delivery support and cost, as well as the ability of the supplier to anticipate and respond to changing customer requirements.

Boeing's global supply chain accounts for approximately 60 per cent of the cost of a Boeing product, and last year the company spent USD62 billion with 13,000 suppliers in 47 countries.

Fellfab (Booth 737) received its award in the Interiors category at a ceremony last month.

Integrated bridge systems contracts for RCN and IN

ROBIN HUGHES

OSI Maritime Systems (OSI) has signed a follow-on contract with Lockheed Martin Canada to build, deliver and support the installation of its Integrated Navigation and Bridge Systems for the Royal Canadian Navy's (RCN) Arctic Offshore Patrol Ships (AOPS). The new implementation-phase contract follows the successful conclusion of a 21-month design phase contract in early 2015.

AOPS is a Canadian government procurement to equip the RCN with six naval ice-capable offshore patrol ships able to assert and enforce sovereignty in Canadian waters, and when necessary, including the Arctic. The first Arctic Offshore Patrol Ship, being built by Irving Shipbuilding, is scheduled for delivery in 2018.

Lockheed Martin Canada

is a tier one supplier to Irving Shipbuilding for the AOPS project under the Canadian government's National Shipbuilding Procurement Strategy. Under the terms of OSI's contract with Lockheed Martin Canada, OSI will deliver six systems, with the first delivery due in late 2016 and the final delivery in 2018.

Separately, OSI (Booth 204) has been contracted by the Indian Ministry of Defence to supply the Integrated Navigation and Tactical Systems (INTS) for the Indian Navy's new-build ABG class Cadet Training Ship programme. The ABG class is a series of three vessels being built by the ABG Shipyard in Gujarat.

INTS is a scalable, IMO and NATO STANAG 4564 compliant system for the military naval market. It builds on OSI's Electronic Chart Precise Integrated Navigation System, integrating selected radars and navigation sensors to provide a comprehensive and cost-effective system that is suitable for newbuilds or existing platform retrofits, from smaller patrol vessels to major warships.

Based in Burnaby, British Columbia, OSI Maritime Systems is a pioneer of the Warship Electronic Chart Display and Information System (WECDIS). OSI's full WECDIS functionality allows a naval platform to operate in the most challenging of navigational and tactical scenarios through a combination of layered fixing techniques and tactical toolsets.

IN BRIEF

Workable solutions to tough problems

C4i Consultants of Calgary, Alberta (Booth 1630) is showcasing the combining of its MILSIM constructive simulation with Bohemia Interactive's Virtual Battlespace 3 (VBS3) into LVCore. This combined training system will allow battalion command and staff training to occur simultaneously with platoon and company training. By combining both virtual and constructive simulations, it allows each simulation to train soldiers at the appropriate level. The company is also demonstrating the latest version of its RADIUS communications planning software at its booth, but RADIUS can also be seen with the DRS TCL Centarus Mission Communications Management System in DRS Technologies' Booth 1511. RADIUS, designed for use by the Canadian Army, is the next generation of communication planning tools.

Processing of complex data with integrity

Data Integrity Institute (Booth 1931) is a leader in research and development of technologies for massive and complex data processing based on its own efficient small footprint nanotechnology sorting algorithm, suitable to embed in the new generation of intercontinental ballistic missiles (ICBMs) and jet fighters. During CANSEC, it will provide live demonstrations of its nanotechnology sorting algorithm that sorts an array of 1 billion double, 64-bit, floating point numbers (IEEE Standard 754), within seconds. Other specialities include ETL (extract, transform load), metadata management, data lineage, data integrity and master data management. ETL combines three functions to pull data out of one database and place it into another.

Today's solutions for tomorrow

Harris Falcon III AN/PRC-158 Type 1 Multi-Channel Manpack

Smaller, lighter, and with advanced mission capabilities, the Harris AN/PRC-158 Type 1 Multi-Channel Manpack is said to be today's solution for tomorrow's warfighter.

The Harris Falcon III radio provides enhanced narrow and wideband waveforms, delivering simultaneous high-speed send and receive of voice and data. The manpack design also eliminates cost and operational complexity by enabling integrated MUOS without the need for a separate power amplifier. Other features include embedded routing and cross-banding and an optional module slot for advanced mission capabilities.

The RF-330E-TR001 is Harris's latest wideband networking team radio, providing seamless voice, high-speed data and up-to-date position location information, enhancing situational awareness while ensuring warfighters are always connected. This secure Rifleman Radio and Nett Warrior offering has unparalleled battery life, transmission range, fast net formation, and user-friendly displays. In April 2015, the US government awarded Harris a 10-year, USD3.9 billion contract for Rifleman radios and associated services under the Joint Tactical Radio System (JTRS) Handheld, Manpack and Small-form fit (HMS) programme. Harris will deliver 50 radios for qualification testing, with full rate production scheduled to start in fiscal year 2017.

Harris Corporation experts will also be at Booth 901 to discuss the performance of radios from its Falcon III family, recently chosen by the Department of National Defence. The Harris Falcon III AN/PRC-152A Wideband Handheld, AN/PRC-117G Wideband Manpack, and the RF-7800H High Frequency Radios will be supplied to the Canadian Armed Forces under a new four-year National Individual Standing Offer (NISO). The radio systems will provide Canadian forces with greater situational awareness and enable end-to-end solutions that address requirements for real-time, mission-critical information on the battlefield.

No optical illusion

Toronto, Ontario-based Newcon Optik has introduced the SEEKER, a compact, MIL-SPEC laser rangefinder module capable of being boresighted to practically any optical system. In addition to use on crew served, sniper and assault weapons, the unit can be integrated into more complex fire control systems to acquire accurate distance, azimuth and inclination target data out to several kilometres.

"Modularity and ease of integration were two critical elements in the design of the SEEKER," said Aaron Buckstein, vice president of sales and business development. "We set out to enable our customers to get rapid, accurate target data and seamlessly process, analyse and use that information in their own systems."

The SEEKER builds on Newcon Optik's 23 years in the electro-optical industry, producing advanced military-grade laser rangefinders. It can be used in conjunction with the company's own Android battlespace management application, or with other Android-based systems or proprietary fire control or mapping software suites, to visualise and act on the geospatial target data it acquires.

Also on display is the SPOTTER LRF, the company's first device combining the high-quality optics of its long-range spotting scopes with an eyesafe 3km laser rangefinder.

Both new products are on display on Newcon Optik's Booth 629, alongside other electro-optical products including image-intensified night vision devices, thermal imaging systems, laser rangefinders and other tactical optics.

SEEKER close up (top) and integrated on weapon (above)

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IN BRIEF

Contracting awards
The Canadian Commercial Corporation (CCC) (Booth 1021) has launched an initiative to recognise its defence and security suppliers and their excellence in export contracting with the USA and overseas. CCC selected AirBoss Defense of Bromont, Quebec (Booth 832), and L3 Wescam of Burlington, Ontario, from 160 suppliers to receive its inaugural 'Excellence in Export Contracting' award.

Investment extension
Mannarino Systems & Software, Saint-Laurent, Quebec, has signed an extension to its seven-year investment agreement with Lockheed Martin. Under the terms of the agreement – which is part of Lockheed Martin's obligation to the Canadian government under an industrial and regional/technological benefits programme – Lockheed will provide additional investment to support Mannarino's business growth as a provider of safety-critical systems, software and certification systems. Mannarino specialises in the design, verification and validation of safety-critical systems, software and electronic hardware for the defence, aerospace, space, simulation and power generation industries. & Medium Employers for 2015.

Firewall certification
The German Federal Office for Information Security has awarded Sophos UTMv9 – a firewall product developed by Symtrex, Toronto, Ontario (Booth 2008) – Common Criteria (ISO 15408) certification under its Common Criteria Evaluation and Certification Scheme. The certification is based on the Common Criteria Version 3.1 Revision 4 for security level EAL4+. Common Criteria is a standard for evaluating the security features and capabilities of IT products.

DAVID DONALD

Here to advise

Having grown out of the UK's defence research and evaluation organisation, QinetiQ is recognised internationally for its wealth of experience and expertise. That knowledge base and analytic skill is increasingly being exported, and the company is involved with many nations around the world. Its capabilities have broadened out from a pure defence base into the security and commercial sectors.

With an office in Ottawa, QinetiQ (Booth 606) is highlighting its expertise across all domains, including cyberspace. For the latter, the company can provide solutions, services and advice across various cyber-security disciplines, with support ranging from high-end strategic solutions to focused applications and network testing.

In the air domain, QinetiQ delivers a wide range of technical services. They include test and evaluation of aircraft, components and systems; design and integration of new technology and systems for upgrade programmes; assistance with maintenance, repair and overhaul activities; and the internationally recognised Empire Test Pilots' School, which provides dedicated training for test and evaluation aircrew.

QinetiQ has been awarded a research contract for military aircrew performance and protection. Among the subjects of the study will be the effects of wearing helmets

Recently, QinetiQ received a four-year contract from the UK's Defence Science and Technology Laboratory to

Long-range pistol power

Interammo Impex (Booth 1911) from Edmonton was established in 2009 as a firearms import-export company. Here at CANSEC, it is showing off the new Arsenal Firearms AF-1 Strike One semi-automatic pistol system, which can be converted from a standard pistol into a carbine in a matter of seconds.

Made in Italy, the Strike One introduces a new locking block system, short recoil and an in-line barrel. The barrel axis is mounted just 12mm above the hand grip, and is claimed by Arsenal to be the lowest in the world. Not only do these features provide excellent controllability and accuracy, but the design allows various muzzle devices to be used with complete safety and reliability throughout the firing cycle.

In standard pistol form, the Strike One has a 127mm barrel, with an option for a 144mm barrel to support silencers. An underside Picatinny rail allows under-barrel mounting of various accessories.

Arsenal AF-1 Strike One in 9x21 calibre

More dramatic is the long-range conversion (LRC) kit. This employs a 300mm barrel that allows the weapon to be converted rapidly into a carbine. Additional furniture includes a folding stock, foregrip and top Picatinny rail for sighting systems. With the long-range barrel, the weapon offers 100 per cent shot placement capability at ranges of greater than 100m.

Intended for military and security forces, Strike One can be chambered for 9x19 Para, 9x121 IMI, .357 SIG and .40 SW rounds. The magazine can hold 17 9mm rounds, or 13 of the .357 and .40 rounds.

Strike One with long-range conversion kit

e and support

undertake research aimed at improving military aircrew performance and protection. This comprises 10 separate research projects covering subjects such as the long-term effects of repeated high-altitude flying, mitigation of spatial disorientation risks, the effects of wearing helmets and helmet-mounted equipment, seat technology, and reducing aircrew fatigue through advanced scheduling tools. In delivering the study, QinetiQ will work with SMEs and academic institutions.

ViewFinder compiles a 3D image of tracks across air, land, sea and underwater domains

A similarly broad range of capabilities, products and services is provided for the naval domain, with expertise spanning the spectrum from shipbuilding to decommissioning. QinetiQ helps military and commercial customers to plan for changes in the maritime environment, as well as to extract greater performance and efficiency from existing vessels. This can be achieved through the application of greater automation to improve safety and reduce manpower requirements, and the optimisation of vessel performance.

An example of QinetiQ's maritime expertise is provided by its ViewFinder combat management system, which has just been made available on the international market. Drawing intelligence from multiple sensors from various suppliers, ViewFinder builds a seamless detailed 3D picture across air, land, surface and subsurface environments, reducing operator workload and accelerating tactical assessment. The software was successfully tested on the Royal Navy's Type 23 frigates.

As well as direct military support, QinetiQ's experts can also offer advice and support in the defence business, particularly procurement. Through its Commerce Decisions division, the company has worked with governments in Australia, Brunei, Finland, NATO, Saudi Arabia, the USA and the UK, as well as here in Canada. QinetiQ has helped to shape procurement strategies and delivered value-for-money programmes while reducing risk. The company has supported more than 9,000 multimillion-dollar programmes, including several at strategic/international level worth more than USD1 billion each.

Uplink gets smarter

Broadband satellite communications specialist Advantech Wireless has released an SSPB/BUC unit for tactical military applications. The 50W X-band block-up converter and solid-state power block is based on the company's cutting-edge gallium nitride technology.

Designed for operation in harsh conditions, the unit is weatherproof and housed in a compact cooling enclosure. It is fully integrated, incorporating power supply, phase-locked oscillator, mixer, filter and cooling. Weighing less than 3.5kg, the SSPB/BUC can be used as a field-deployed man-pack terminal.

A BUC converts signals of lower frequency bands into the higher frequencies employed in satellite uplink transmissions. Advantech Wireless (Booth 1431) claims the new system offers the highest power output per square inch of antenna available on the market.

IN BRIEF

One-stop source for calibration

Montreal, Quebec-based Primo Instruments (Booth 429) has been providing test and measurement products and services since 1987. Accredited to ISO 17025, it holds more than 250 accredited capabilities audited by the metrology experts at A2LA. The company also offers various calibration services, including on-site calibration, access to certificates 24/7, and a calibration turnaround time of three to five days.

Compounds for EMI gaskets

Elasto Proxy of Boisbriand, Quebec (Booth 935) manufactures EMI gaskets made of particle-filled silicones – elastomeric compounds that combine the advantages of silicone rubber with the electric properties of metals. When filled with tiny metal particles, typically silver-plated or nickel-coated, these compounds provide environmental sealing, electrical conductivity and resistance to electromagnetic interference.

Insight is key

Better testing done sooner equals deeper confidence in electronic warfare (EW) system performance. The N5193A UXG agile signal generator is a powerful building block, whether you need a dependable LO or a scalable threat simulator. It provides complex EW threat simulation, in an off-the-shelf solution, lowering the barriers between new intelligence and up-to-date signal scenarios. To simplify signal creation, N7660B Signal Studio for multi-emitter scenario generation delivers Keysight-validated, performance-optimised signals that can be downloaded directly into one or more UXGs as a pulse descriptor word list. Keysight Technologies (Booth 320) is a UK-based leader in electronic measurement.

New identity, greater depth

Martec – a Canadian engineering firm specialising in advanced engineering simulation technology and modelling for the design and analysis of complex systems and structures, including surface ships, submarines and armoured vehicles – is at CANSEC under its new identity: the Applied Technology Group, which is now part of Lloyd's Register.

Colin Clark, general manager of Lloyd's Register Applied Technology Group, said: "In 2008, Martec was purchased by Lloyd's Register and started the process of integrating itself within the Lloyd's Register family. We had developed strong technical expertise across a number of domains and had established a solid working relationship with the Royal Canadian Navy – and Lloyd's Register works with navies all over the world – so it seemed like a good fit. Our Martec name became a bit of a stumbling block, because while it meant a lot to Canadian government clients, but it didn't resonate anywhere else within the Lloyd's Register organisation.

"This new identity as the Applied Technology Group gives us a platform to pull expertise from across the Lloyd's Register organisation – now we have a clearer path to bring that expertise here into Canada. The message we are bringing to our clients is that we are part of this larger organisation and now we have all the expertise of this organisation to bring to them as well."

Officially redesignated on 21 May, ATG (Booth 333) will exploit its established Martec capabilities in explosive modelling and structural response to protect land forces and equipment – including vulnerability analysis projects, blast-resistant design, and ballistic analysis and force protection studies – and in naval architecture and marine engineering technology, to provide naval forces with detailed finite element analysis, seakeeping, fatigue and underwater shock analysis, ship signatures and ultimate strength.

Multi-fue

DEW Engineering & Development (Booth 1111) is offering a new snowmobile that has been designed with military operations in mind. The chief innovation is its ability to run on

V-AMMS is highlighted in a Dutch special forces vehicle

Hear and avoid

DAVID DONALD

Rapidly detecting and locating threats can not only save lives but also significantly enhance combat effectiveness. Microflown Avisa from the Netherlands has produced an acoustic detection system that can spot a range of battlefield threats, such as small arms fire, rockets, artillery and mortars.

The company's Acoustic Multi-Mission Sensor (AMMS) can also measure the direction of the hostile shooter, to an accuracy of 1.5°.

Microflown Avisa (Booth 931) can apply its AMMS technology to a variety of uses. The V-AMMS vehicle-based sensor is fielded with the Dutch special forces to give 360° protection to vehicles. The system's low size, weight and power requirements allow it to be easily fitted to a range of platforms, including UAVs, helicopters and fixed listening posts.

Weighing only 110g, the UAV-based version can provide 'hear and avoid' capability for the air vehicle. It has been test-flown on the Polish FlyEye UAV with a fairing projecting from the port wing leading edge containing the AMMS sensor. It is also small enough to be carried by unmanned air vehicles of multi-rotor configuration.

el snowmobile

the fuels that are routinely in use with military forces, but it also offers long range for extended patrols, and a good load-towing capability.

Designated D900, the military-grade snowmobile's three-cylinder turbocharged engine can run on either F-34/JP-8 or diesel fuel. The vehicle offers excellent fuel economy, equating to a range of more than 500km, and can tow loads of 400kg. It also has a large internal stowage area and brackets for the external carriage of supplies and equipment.

Most of the components, including the driveline, have been procured off-the-shelf, but have been selected to ensure durability and performance, as well as the ability to provide long-term servicing and support. The design reflects a drive for ease of maintenance in harsh conditions, with systems and components easily accessible.

In April, D900 snowmobiles were deployed with the Canadian Rangers and other military personnel for an evaluation. They were sent to Cambridge Bay, Nunavut, on Victoria Island for Arctic trials in the vicinity of the DEW Line radar site.

Tuned in and agile

ROBIN HUGHES

Nanowave Technologies is showcasing its expertise in the design and manufacture of high-performance agile source and frequency conditioning components with new solutions designed to improve radar, electronic warfare and signal analysis and discrimination.

Nanowave's new ultra-low noise K-Band synthesiser, the NWO17G25-10-1, delivers phase noise performance of -120dBc/Hz at 100kHz offset at 20GHz, fast frequency switching (<10µs) and low spurious performance from 17-25GHz, using the company's patented technology and patent-pending circuitry for spurious signal suppression. The NWO17G25 is well suited to high-performance radar, test and electronic warfare applications.

The NWO0812 series X-band radar exciter synthesiser uses a combination of direct digital and indirect synthesis techniques to cover the full X-band frequency range, with phase noise performance better than -110dBc/Hz at 100kHz offset at 10GHz. The NWO0812's frequency sources use Nanowave Technologies' compact miniature hybrid assembly process, which features optimally matched die in hermetic enclosures to meet MIL-STD-883 and MIL-PRF-38534 conditions. The unit's low *g*-sensitivity, high performance and compact size make it ideal for airborne radar applications.

Finally, the NWETF9395B183K is an electrically tunable filter (ETF) capable of agile frequency selection over multi-GHz bandwidths. It is ideal for signal analysis, signal discrimination, and post-filtering applications. The ETF filter bandwidth and stop band rejection can be customised to meet specific requirements. The ETF displayed at CANSEC (Booth 109) features sub-100µs tuning time with greater than 50dB stop band rejection at X-band and a 3dB pass band of 183kHz.

The human touch

ROBIN HUGHES

Human Systems Incorporated (HSI), a human factors specialist based in Guelph, Ontario, is supporting Canada's Defence Research Establishment Atlantic Navy R&D initiative to improve situational awareness for command decision-making in the RCN's Victoria class submarine.

Addressing an abiding problem common to modern C^2 systems where information is distributed through stovepipe systems and therefore fails to provide an integrated situational awareness picture, HSI has designed a prototype display concept that fits in the confined space available in the boat, and that integrates existing C^2 information flow. The new design integrates information from the submarine's mechanical, propulsion, navigation, sensor and weapons systems to deliver a comprehensive real-time picture.

HSI's Navy team is also building a dynamic task flow model of the Victoria class's sonar team activities – based on a simulated eight- hour operational scenario – to provide for workstation/personnel optimisation with a view to accommodating a major upgrade to the boat's existing sonar systems. A similar analysis is underway with the new sonar system; a future trial, based on the same operational scenario, will be used to collect comparative task activity and timing data that will subsequently be compared with the baseline data. This comparison will be used to identify potential personnel overload situations and effects of long watches on the team's performance. HSI says the data will inform recommendations for future crewing requirements for the Victoria class's new sonar system.

Separately, HSI, in conjunction with the US Marine Corps (USMC), has over the past seven years designed and developed a 10-station instrumented obstacle course (with four accessory tasks) designed to reflect infantry combat activities. This will enable procurement leaders to select clothing and equipment to allow infantrymen to perform their tasks with minimal negative impact on their performance. The Load Effects Assessment Program (LEAP) provides information on how certain combat loads, pieces of equipment, clothing or weaponry affect the performance of a soldier. LEAP is becoming the international standard of soldier performance testing, and is currently used by the Canadian Forces, USMC, US Army and the Australian Department of Defence.

LEAP examines the effects of combat loads, clothing, weaponry and equipment on soldier performance

HSI is supporting human factors for the FSAR 'smart gun'

Data from the Canadian Forces Anthropometric Survey informs the design of new equipment

HSI (Booth 503) is also the prime contractor team behind the Canadian Forces Anthropometric Survey, which provides critical data to inform the design of new equipment and user dimensions in the development of military systems, and sizing tariffs for equipment procurement. The study is the most comprehensive database of the physical size and shape of the Canadian Armed Forces, with more than 2,200 forces personnel measured.

HSI is also the main human factors contractor on the Defence Research and Development Canada's Future Small Arms Research (FSAR) and Soldier Integrated Precision Effects Systems programmes. One of the weapon prototypes, developed by Colt Canada, is coined the 'smart gun' because it has been used to investigate advancements in ammunition, sensors and data management. HSI will support the maturation of the smart gun under the FSAR programme, with research to resolve multiple human system integration challenges at every development stage.

Women to the fore

ROBIN HUGHES

Thousands of women working at all levels in Canada's defence and security industry, in both the public and private sector, are being championed by an exciting organisation affiliated with the Canadian Association of Defence and Security Industries (CADSI).

Established in 1985, Women in Defence and Security Canada (WiDS) is a volunteer organisation dedicated to the advancement of women leaders in defence and security professions across Canada. WiDS provides its members with a networking forum to further business and individual career objectives; the organisation also supports women pursuing careers in defence and security through scholarship and sponsorship initiatives, and through events, both formal and informal, offering networking and mentoring opportunities for its members.

But WiDS isn't just for women – men are also invited to be part of the organisation – and if you're interested in recruiting some of the brightest and most talented women in the Canadian security and defence sector to your company or department, then WiDS offers the platform to do so.

WiDS is also looking for volunteers and sponsors to support its activities going forward – interested? Come and meet them at Booth 2304.

Environmental training for aircrew

Last month, the Aircrew Training Systems business unit of Environmental Tectonics Corporation was awarded a series of contracts for aeronautical training systems for customers in the Middle East. ETC is exhibiting at CANSEC as part of the Advance Systems Marketing International display (Booth 1627).

Included in the contracts are an ATFS-300 tactical flight simulator (*pictured*) with spatial disorientation training capability, an eight-person rectangular hyperbaric chamber, hypobaric chambers with 12- and 16-person capacities, two ejection seat simulators, night vision/night vision goggle trainer and a parachute descent and landing simulator.

ETC specialises in the design and manufacture of software-driven products and services that recreate and monitor the effects of motion on humans, and equipment to simulate and measure environmental conditions. It also produces equipment for non-aerospace applications such as disaster management systems, sterilisers and hyperbaric chambers.

This is SPARTA

Lockheed Martin Canada Mission Systems and Training is supporting the development of a unique underwater warfare system by Ottawa-based Maritime Way Scientific (Booth 1529).

The Lockheed Martin funding initiative will support the continued advancement of Maritime Way's Sonar Performance-Acoustic Research-Tactical Analysis (SPARTA) acoustic modelling system and tactical decision aid technologies, which characterise the way sound travels in the water to create a tactical advantage. SPARTA predicts ocean sound-scapes, defines sonar and sensor placements and assists the warfighter to find enemy threats.

"Today's naval fleets must be designed to incorporate a wide array of capabilities to function effectively in the multi-dimensional theatre of operations," explained Martin Taillefer, president and managing director, Maritime Way. "The security, survivability and underwater warfare prowess is directly influenced by the operational environment. Without a clear understanding of the environment, the vulnerability of any unit is increased considerably."

"In Canada, there is a recognised need to enhance, establish and sustain these innovative technologies for underwater warfare," added Rosemary Chapdelaine, vice president and general manager of Lockheed Martin Canada Mission Systems and Training.

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Canada first: DND's procurement and industrial strategy

ANDREW MACDONALD, SENIOR RESEARCH ANALYST, IHS JANE'S

As a prosperous and stable country, Canada faces few direct security threats either internally or from overseas. Canadian foreign and security policy is focused on the promotion of international peace and stability through the fulfilment of its commitments to NATO, the United Nations, and other multilateral bodies. The government regards a stable world order as central to the physical security of Canada and essential for the domestic prosperity of a country heavily dependent on international trade, especially with the United States

Canada's defence industry is extensive, although indigenously owned companies tend to be small and medium-sized enterprises (SMEs). This can be attributed to the extensive acquisition of larger Canadian firms by major international companies and the resultant influx into the country of their subsidiaries . Conducting business in Canada is generally straightforward, given the mature and stable nature of the country, although defence market entrants may face some challenges.

The strategic military investment plan detailed in 2008's Canada First Defence Strategy document was aimed at eradicating funding shortfalls experienced in the past and recapitalising the military. However, the plan's ambitious proposals were modified as a result of funding constraint during the global economic downturn and expenditure is now not expected to substantially recover until 2017, leaving the solidity of procurement plans in some doubt. Procurement has not always proceeded smoothly and the government has faced criticism over transparency, cost increases, delays and uncertainty on a number of projects. The release of the country's Defence Procurement Strategy in 2014 was designed to address these problems, as well as to respond to input from industry. Part of the new strategy was the introduction of an annually published Defence Acquisition Guide (DAG), which details Canada's expected requirements and ongoing acquisition programmes. DAG is due to be released in May at CANSEC 2015 in Ottawa.

The Canadian approach to offset also changed significantly in 2014 with the shift from Industrial Regional Benefit (IRB) programme to a one based on Industrial and Technology Benefits (ITBs). While the Canadian economy has benefited from the IRB, the policy had been criticised by industry for lacking flexibility. Under the ITB Policy, winners of defence contracts are obliged to 'undertake business activity' in Canada, the value of which must be at least the same as the value of the contract awarded. Although procurement expenditure is expected to remain flat until after 2017, Canada is still currently investing substantially in new and upgraded military capabilities across all three of its armed services. Programmes are under way for new aircraft, armoured vehicles, and naval vessels.

PHOTO: US NAVY

Canada is seeking to replace both the Halifax class and Iroquois class under the Canadian Surface Combatant Programme

Major procurement programmes

Canadian Surface Combatant
The Canadian Surface Combatant (CSC) programme will replace the navy's three Iroquois-class destroyers, which entered service in 1972-73 and reached the end of an extended service life in 2012, and the 12 multirole Halifax-class patrol frigates, which are currently undergoing major modernisation and are projected to reach the end of their service lives in 2020. The CSC project stems from the navy's earlier Single-Class Surface Combatant study. The first ships to be built will replace the Iroquois-class destroyers in the command and control and area defence role. At a later stage, a general-purpose variant will be built to replace the Halifax-class frigates.

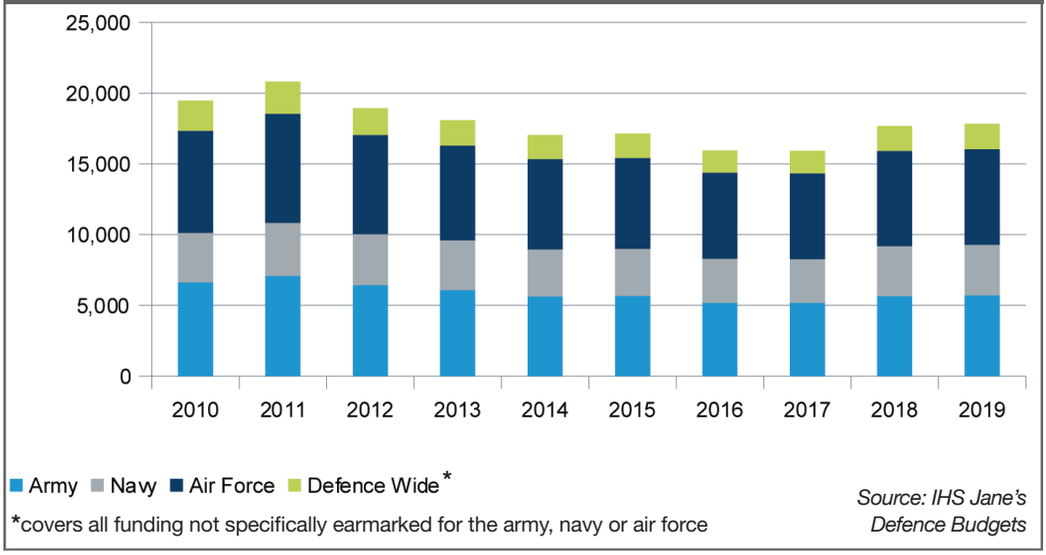
Joint Support Ship
Intended to replace the navy's two ageing Protecteur-class auxiliary oiler replenishment vessels, the Joint Support Ship (JSS) will combine core afloat replenishment capabilities with additional capacity for sealift and logistic support to forces ashore. Impetus was added to this procurement following a serious fire aboard HMCS Protecteur in early 2014, which may lead to the vessel's early retirement. The two ships – with an option for a third – are classed as non-combat vessels under the government's NSPS. Their primary role will be to support the navy's task groups. While the ships will be built by Vancouver Shipyards, their design will be provided by ThyssenKrupp Marine Systems Canada, which is modifying its German Navy Type 702 Berlin-class design baseline to meet Canadian requirements. The government previously announced that it expects to award a production contract in 2016. Full operational capability for both vessels is projected from 2020.

CF-18 Replacement Project
In 2002 Canada became a Level 3 partner in the US Lockheed Martin-led Joint Strike Fighter (JSF) programme and in 2006 it signed the Production Sustainment and Follow-on Development (PSFD) Memorandum of Understanding (MoU). However, in 2012 Canada's auditor general Michael Ferguson issued a highly critical report of the programme's decision making and cost-control. In the wake of the report responsibility for the replacement fighter programme was transferred from the Department of National Defence to a new F-35 secretariat in the Department of Public Works. In January 2013, Canada decided to 'reset' the NGFC project, funding was frozen and a review of the potential alternatives was initiated. Part of the plan to move forward with replacing the CF-18 includes commissioning an independent review of the government's fighter acquisition processes so far. Boeing, Dassault, and Eurofighter have all approached Canada to offer alternatives to the F-35. The programme was included in the Defence Acquisition Guide 2014 with an anticipated final delivery period of 2026 to 2035.

PHOTO: NASA

The Canadian CF-18 is expected to retire from service in 2020 and the country is reviewing possible replacements

Canadian Defence Budget 2010-2019 (Constant 2015 USD billion)



*covers all funding not specifically earmarked for the army, navy or air force

Source: IHS Jane's Defence Budgets

Fixed-wing search and rescue aircraft
The Fixed Wing Search and Rescue (FWSAR) programme aims to replace the Canadian fleet of DHC-5 Buffalo transport aircraft which were initially earmarked for retirement in 2010 as part of the official Canadian DND aerospace capability plan. A FWSAR project office has been established in order to facilitate the acquisition and in 2004 a Statement of Requirements (SoR) was drafted. The programme was subsequently delayed by more pressing needs within the defence budget such as the conflict in Afghanistan and large acquisition programmes such as the C-17 and 130. A draft request for proposals (RfP) was released in August 2013 and the final RFP was expected to be published in 2014. However, further delays pushed the final document release back to 31 March 2015. Alenia's C-27J and Airbus C-295 remain the two most likely contenders for the requirement although Viking Air with the DHC-5 Buffalo and Bombardier with the DHC-8 remain interested in the programme. The total cost of the programme is expected to be over CAD1.5 billion, although support agreements are likely to push the potential contract value closer to CAD3 billion. The programme was included in the Defence Acquisition Guide 2014 with an anticipated final delivery period of 2021-2025.

Source: IHS Jane's Navigating the Emerging Markets Series. For more information please go to www.ihs.com/products/janes-emerging-markets-intelligence.html

A capital experience

Visitors to CANSEC 2015 should make plans for a few extra days after the show, for Canada's capital city has much to offer, with all interests catered for.

Those keen to learn more about the country's fascinating history should head straight for the Canadian Museum of History, a huge space encompassing hundreds of years of history. From the First Peoples Hall, with its focus on the First Nations, through the Grand Hall, home to the world's largest collection of totem poles, visitors will enjoy an unforgettable experience. CANSEC exhibitors and visitors will be in time to take in a special exhibit, recalling the tragic collision in 1914 between the passenger ship *The Empress of Ireland* and a collier, which claimed more than 1,000 lives in just 15 minutes.

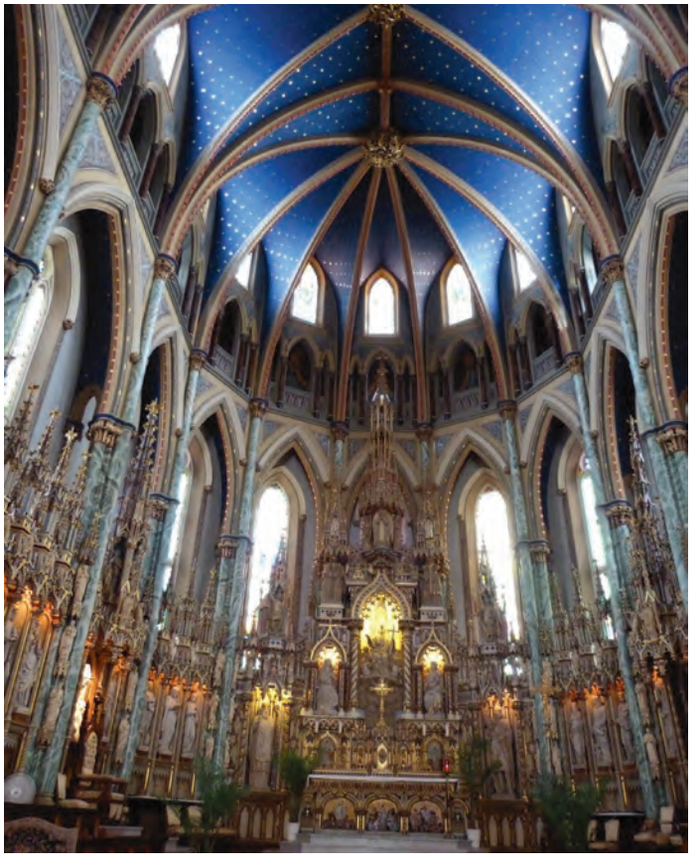
A look across the Ottawa River will reveal the towering Parliament Hill and its Victorian buildings. Every morning, the front lawn is the setting for the Changing of the Guards, while evening crowds can enjoy the spectacular sound and light show. Right next to Parliament Hill is the Rideau Canal, a UNESCO World Heritage site, which connects with the Ottawa River through a series of stepped locks.

Parliament Hill viewed from across the Ottawa River

Those with a special interest in Canada's rich military history and associated aircraft, submarines and tanks, should head to the nearby Canadian War Museum, which covers everything from the earliest days of New France to present day operations. On a more peaceful note, the National Gallery of Canada houses the most comprehensive collection of Canadian art, including Inuit art.

Ottawa's neighbourhoods offer great ambience and distinctive shopping, dining and nightlife. From the moment the sun rises to long after the streetlights are turned on, Ottawa offers a great welcome.

Totem pole in the Canadian Museum of History



Notre-Dame Cathedral Basilica was completed in 1885

The Maman bronze spider sculpture at the National Gallery of Canada stands more than 10m high

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