



BOEING MAY OFFER V-22 FOR FWSAR

CH-47F Chinook will be upgraded for Canadian order

CDR recently sent Senior Writer Joetey Attariwala to visit some of The Boeing Company's operations, including plants that manufacture the Chinook helicopter for Canada and the Scan Eagle UAV used by the CF in Afghanistan. Here is our report.

TESTING THE V-22 OSPREY AT SHEARWATER

My first stop on a whirlwind fact finding tour of Boeing aircraft manufacturing plants was in Philadelphia where the company has its Rotorcraft Division. Here, Boeing manufactures the CH-47F Chinook and the fuselage section of the Bell Boeing V-22 Osprey. The wing and engine nacelle sections of the V-22 are manufactured by Bell Helicopter in Texas. Mating of all major sections of the V-22 also occurs in Texas where completed aircraft undergo flight testing prior to delivery. Currently the U.S. Marine Corps,

U.S. Navy, and U.S. Air Force operate the very capable V-22. Boeing is keen to point out that search and rescue was one of the missions the V-22 was designed for. As a result, the U.S. Special Operations Command operates their CV-22's in a variety of roles, including Combat Search and rescue (CSAR).

The ability of the V-22 to take off like a helicopter and tilt its engines forward to cruise like a fixed wing aircraft has proven to be very useful. This capability allows the V-22 to operate from remote and austere fields and once airborne the aircraft can achieve cruise speeds of 260 knots.

These specs happen to fit nicely with current SAR requirements in Canada. Not only could the V-22 launch and travel long distances to locate those in distress, but the aircraft can then transition into helicopter mode to land and pick up the same individual(s). Augmenting the V-22's tilt-rotor technology are advanced avionics, cockpit and sensors. Some key features of the V-22 are a multi-mode radar, a refueling probe, wing de-ice capability, a rear ramp, single and dual-point cargo hooks, a rear hoist and an electro-optic and infrared (EO/IR) sensor. Although an EO/IR sensor kit is not unique to

the V-22, it is virtually essential for modern search and rescue duties. All of these systems have been tested in combat as the V-22 has deployed to Iraq and Afghanistan. The aircraft's cargo capacity has also been helpful in rendering aid during natural disasters like those recently seen in Haiti. "In the late 90's we spent a lot of time doing cold weather testing with the V-22 in Shearwater. We validated a lot of test points and have no concerns about operating in cold weather or in northern latitudes," Bill Sunick, Marketing and Sales Manager for Boeing Rotorcraft Systems, told CDR.

ENHANCED CHINOOK VARIANT FOR CANADA

Canada awarded Boeing a contract for fifteen CH-47F Chinook tandem rotor helicopters for the Medium Heavy Lift Helicopter (MHLH) program. Being a tandem rotor helicopter, all of the power generated by the engines is translated into lift, which gives the Chinook the enormous lifting power it's renowned for and the high/hot operating capability that's required in countries like Afghanistan.

The Canadian aircraft will soon be in the manufacturing pipeline, and will be enhanced from the standard CH-47F variant. Canada's new Chinooks will be fitted with larger conformal fuel tanks, a 'long nose' to facilitate additional radar capability, an L-3 Wescam EO/IR sensor, increased electrical generating capability, and an enhanced defence/electronic warfare countermeasures suite. An important feature on the CH-47F is the glass cockpit which provides enhanced situational awareness, mission planning and navigation capability. Canadian Chinooks will be delivered 36 months from contract award date, and will be based out of CFB Petawawa.

Dennis Morris is Boeing Program Manager for Canada Chinook Program. He told CDR, "One thing about the MHLH is that it has a very significant aircraft survivability suite. The equipment that's going on this aircraft will make it state-of-the-art with the most advanced survivability equipment package that is available on any Chinook model. It also has ballistic protection and crashworthy seats. The off-the-shelf Cargo Hook Load Measurement System is also being integrated onto the MHLH. The defensive electronic warfare system also requires an upgraded electrical system which will be deployed on the MHLH, and is new to the platform. There's a lot of capability in the Chinook for Canada."



Boeing's Super Hornet would be a very capable replacement for the CF-18

Boeing also showcased the new AH-6i light attack / reconnaissance helicopter. The low cost AH-6i is geared for international customers and has leveraged AH-64 Apache software and cockpit technology. Integrated onto the AH-6i is the L-3 Wescam MX-15Di EO/IR targeting sensor. The AH-6i's weapons capability is centered around two pylon stations on each side of the aircraft which can mount Hellfire missiles and 70mm rockets. Additionally, a 7.62 minigun or .50 cal GAU-19 gun can be mounted to the aircraft.

SUPER HORNET FROM BOEING COULD REPLACE THE CURRENT CF-18

St. Louis is Boeing's home for fighter aircraft and here the F-15 Eagle, F/A-18E/F Super Hornet and EA-18G Growler are manufactured.

Sections of the C-17 Globemaster III are also built in St. Louis, and then shipped to Long Beach, California, for major join and final assembly.

Boeing is very interested in proposing the F/A-18E/F Super Hornet multi-role fighter for Canada's Next Generation Fighter program. Manufactured in the single seat E model or the two-seat F model, a myriad of capabilities exist in the Super Hornet. All aircraft coming off the production line are Block II Super Hornets which are fitted with Raytheon AESA radar. These radars are very capable and allow pilots and weapons systems officers (WSO) to fly and fight the Super Hornet in air-to-air and air-to-ground modes simultaneously. Although sensor fusion reduces pilot workload, it's clear that the two-seat F-model is very versatile as both crew members can



Canada has ordered the Chinook F model



The Canadian Navy recently tested ScanEagle

work together or independently, which enhances mission effectiveness. The F-model also facilitates pilot training as a stick and throttle package can be integrated into the rear seat, thus making the Super Hornet a true in-flight training aircraft. The Super Hornet is also one of the only fighter aircraft in the world that allows the use of joint helmet mounted cueing systems for both the pilot and WSO.

These attributes, along with the necessity to replace and augment their combat fleet led Australia to procure the F/A-18F Super Hornet. All reports indicate that the Royal Australian Air Force is very pleased with the

capabilities afforded by the Super Hornet, as well as the force multiplying effect they have on their legacy/classic Hornets by way of data link communications.

A key feature of the Super Hornet is its dual engines. Many pilots, especially those that fly off aircraft carriers and those that fly long distances over uninhabited terrain desire the redundancy of two engines as well as the redundancy of multiple hydraulic and electrical generating systems.

Boeing has designed the Super Hornet with low-observable (stealthy) attributes and materials where appropriate. The aircraft is approximately 25% larger than legacy

Hornets which allows the airframe to have large control surfaces and eleven weapons stations. Large control surfaces are important in increasing manoeuvrability and decreasing recovery speeds, and the robust carrier landing gear allows pilots to plant the aircraft firmly on the runway which is important in wet or icy conditions.

CHIEF TEST PILOT FROM CANADIAN AIR FORCE

One of the highlights of my visit was a candid discussion with Ricardo Traven, Boeing Chief Test Pilot for Super Hornet. Traven is a former CF-18 pilot, and offered some first-hand comments that other Canadian fighter pilots would certainly appreciate about the Super Hornet. "A Super Hornet with AIM-9's and AIM-120's will weigh around 48,900 lb and with that weight we can takeoff in about 1,400 feet. A similarly loaded A/B Hornet will takeoff in 3,000 feet. That is noticeable by every Hornet pilot that jumps into a Super Hornet. The Super Hornet's thrust is one factor, and the other is the flaps. Having been to Whitehorse and Inuvik and points north, I can tell you that is really important because runways are short," said Boeing's Traven.

Another advantage of Super Hornet is its ability to act as an airborne refueling tanker. This capability is a force multiplier for any Air Force operating independently or in a joint coalition operation. The capability allows a single squadron to not only self-escort themselves, but also sustain themselves with fuel to travel long distances as is encountered in Canada and elsewhere. Once the tanker has delivered its fuel, it can still orbit and engage other aircraft with its air-to-air missiles, or assist other aircraft or ground troops by utilizing its Raytheon AESA radar. The capabilities a Super Hornet can give an operator are truly impressive.

Mike Gibbons, Boeing Program Manager for F/A-18E/F Super Hornet pointed out that the, "Super Hornet offers 21st century capability and meets or exceeds Canadian requirements. The aircraft is combat proven and fits the Canada First Defence Strategy. We have a Flight Plan where we're working with our customers to keep adding capabilities to the aircraft in future years. We've grouped our Flight Plan in categories of sensor integration, airborne networking, additional weapons and others. There's also a lot of room for additional AESA upgrades. In Canada, we commit to 100% IRB in Canadian Content Value to Canadian industry which guarantees more jobs for Canadians."



Boeing's V-22 could replace the Buffalo for SAR with greater capability



The C-17 from Boeing has been a workhorse for the CF

P-8 – A NEW BREED OF MARITIME PATROL AIRCRAFT

Boeing in the Pacific Northwest is home to the new P-8A Poseidon multi-mission maritime patrol aircraft, which was designed to replace the aging P-3 Orion in U.S. Navy inventory. India has purchased the P-8, becoming the first international customer for the type. Australia has signed a memorandum of understanding with the U.S. Navy and will collaborate in the P-8 program in the future.

The P-8 is a derivative of Boeing's very popular Next Generation 737-800 commercial airliner. The aircraft is largely a sensor integration solution to the multi-mission maritime patrol role, with the biggest structural change being the addition of a weapons bay. The primary roles for the P-8 include maritime patrol, anti-submarine warfare and reconnaissance.

The 9 person crew will use an open architecture mission suite with a state-of-the-art mission computing and display subsystem which can display and operate any of the sensors aboard. Five tactical workstations will be installed in the forward fuselage section of the aircraft. An L-3 Wescam EO/IR sensor turret is integrated to the airframe, along with an AN/APY-10 multi-mode radar and over 100 antennas. Three rotary sonobuoy launchers and several pressurized launchers, along with sonobuoy racks are fitted at the aft part of the aircraft. Weapons capability

includes torpedoes, sea-mines, and anti-ship SLAM-ER missiles. Performance in the arctic environment has been studied in detail with no deficits expected.

The P-8 test program includes five development test aircraft. Three are flight test aircraft, and two are static and fatigue ground test assets. Three other aircraft will be production representative test aircraft that the U.S. Navy plans to operate in their Operational Evaluation phase. A P-8 is currently undergoing testing at Naval Air Station, Patuxent River to test airworthiness and envelope expansion. Parameters to be tested include flying qualities, performance, loads and in-flight refueling. The U.S. Navy plans to procure 117 production aircraft.

UNMANNED SOLUTIONS FROM INSITU

Insitu, located in Bingen, WA, specializes in unmanned systems and is a wholly owned subsidiary of The Boeing Company. Most notable of these systems is the ScanEagle, which Canada is currently operating in Afghanistan under the Small UAV program. The ScanEagle has proven to be an invaluable asset for commanders in the field, and recent advances offer a heavy fuel engine derivative.

The Canadian Navy recently tested ScanEagle from HMCS Glace Bay off the East Coast of Canada. The Navy is currently examining the capabilities of unmanned

systems and are continuing with the development work to support such systems.

Insitu has developed the NightEagle, a ScanEagle variant that has advanced IR capability for night operation. The ScanEagle system consists of a modular vehicle that can be modified with various payloads to suit mission requirements.

Most recently, Insitu has developed the larger Integrator UAS. Like ScanEagle, the Integrator is modular in design and has enhanced range and payload capability for operation during day or night. Satellite communication can facilitate operation of Integrator beyond line of sight. A common ground control station, launcher and SkyHook recovery system is used for all Insitu unmanned aerial systems.

After our tour of the above mentioned Boeing operations we came away with the impression that this is truly a diverse and expansive company with products that offer solutions for many CF programs and requirements. The company's reach into Canada is great, and successful programs like the C-17 procurement and CF-18 modernization have given Boeing clout as a formidable prime contractor for Canada's defence needs. ■

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