

# Chief Air Force Engineer Positively Awesome 'OWSM'

**Brigadier-General Dwayne Lucas** is the Chief Engineer for the Air Force. As Director General Aerospace Equipment Management, under Assistant Deputy Minister (Materiel), he is responsible for the acquisition of assets for all aircraft (including ground based assets that support aircraft), and he is also responsible for all service support.

Managing a budget of about \$1.26 billion annually, and overseeing a force of about 1200 personnel to execute the tasks, makes BGen Dwayne Lucas difficult to nail down for an interview, but *FrontLine* persevered, to give our readers an inside view of the man and the position that keeps the Air Force flying high. We wanted to know more about the revolutionary Optimized Weapons System Management, better known among his staff as "Awesome."

## What are your main responsibilities?

The job, primarily, is two-fold. It is to sustain the equipment that is in service and to make sure that the operational commanders have the equipment that they need on a daily basis. Our second responsibility is to acquire the new equipment (the capital acquisitions), and to modify and change the current equipment that we have in service.

## What are the main challenges you face in accomplishing these tasks?

The biggest challenge is the number of contracts. We now execute over a thousand contracts and we're trying to streamline that system. We are working toward improving the integrated logistics support system for our aircraft fleets.

When I came into the job a couple of years ago, we introduced the management concept of Optimized Weapons System Support. It is aimed at reducing the number of contracts on the various aircraft, reducing the cost of supporting the fleets by 15%, increasing the operational out-

put, preferably by 20-25%, and freeing up personnel from managing those contracts and refocus them on new acquisitions, new development and new optimization.

## What benefit will we see through OWSM?

The first program that went through OWSM was the C130 Hercules aircraft. We were struggling to maintain the old fleet and we needed to enhance the operational output, so we've put together a program for that. The bids are all in right now, and we're evaluating them. We're confident that when we are finished that program and have selected a winning bid, that we will have a better performance basis, increased operational output, and we will reduce our annual cost by 15% (saving about \$12 million a year).

We are working with two major contractors right now for the avionics side and for the air frame side of the CP140 Aurora. We are upgrading the airplane, but as part of that we are trying to get the service support piece optimized.

The key issue behind this is finding savings from the huge expense of maintaining the asset. When you have operated an aircraft for an extended period of time, such as the Sea King, you find that the capital cost represents as little as 5% of the value of the program – with the balance for in service support. We can't focus on the capital cost anymore, the price to *buy the car*, we must focus on the cost to *support and repair the car* over the years, because that's where the real money is. Based on this premise, the plan was to get a really solid program that encourages industry to do the job better.



*With a degree in Mechanical Engineering, and a Masters of Science in Aircraft Design, Brigadier-General Dwayne Lucas (right) marked many milestones as he rose through the ranks, such as his involvement with the CF-18 Engine Test System and then in the Directorate of Aeronautical Systems Engineering. He later led the Fighter Genesis team which saved \$250 million for the Fighter force. In 1998, he became Director of Aerospace Program Management and CF18 Hornet Modernization. Promoted to Brigadier-General in 2000 and assigned to 1 Canadian Division A1/A4, he was responsible for Personnel, Training, Reserves, Logistics, Airfield Engineering and Maintenance. Two years later, he joined the Aerospace Equipment Management Division, this time as the Director General. He is planning to retire this fall.*

In the past, contracts have been based on time and materials. But, without hard specified outputs, times were extended, costs went up, and control and management was difficult.

Through OWSM, we're now moving to a performance-based contract with the companies – and rather than having up to 300 contracts on a given fleet, we're dropping to less than five contracts.

We've put more responsibility on industry, and we also give them flexibility to introduce good ideas to optimize the program – and we give them standards to perform to which will be evaluated regularly, and if they do a good job they benefit, so it's an incentive based program that encourages them to continually optimize.

With detail-level work being transferred to industry, that it will free up some of our people for all of the new acquisitions that we're planning within the department. Our service and support budget is \$800 million per year. It is much higher than the Army and Navy because, other than what's done on the front lines at the squadron level, support is all done

by industry. The decision was made a number of years ago that we would principally do our aviation support in industry. The potential 10-15% savings on a budget of that size will be huge – and which we can re-invest to do the tech upgrades on a regular basis.

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### How does the new contract system work?

When we acquire a new aviation asset, we want the company that manufactures the aircraft create a support program at the same time, and we want to hold them accountable to their sales pitch. We will write a multi-year contract that's going to say 'right on, we trust you, we believe you, that's exactly what we want, and we're going to contract you to produce the level of performance that you've bid to us in the bid phase.' We're going to contract to that, and industry will provide the support.

As an example, I sit on the Joint Strike Fighter (JSF) board, and we're in a discussion right now on long term service support, it's called Autonomic Logistics Program. They were initially looking at a three to five year contract, but at the meetings I pointed out that such a short term doesn't hold the contractor responsible, it is simply a burn in phase. What you need to do, is go to 10, 15 or 20 years, so when the company says 'this flight control computer will last 1,000 hours before it breaks,' we're going to sign a contract to that, so if he hasn't got it right in the beginning then he will have to support and rectify it. On the other hand, if it lasts longer than forecasted, then we save some money in repair, and we're going to share some of that savings with the company.

I guess one of the key things is that we're starting to create the behavior of an industry that we want to see without debates on delivery and arguments about who said what. We need to get out of that climate of adversity and create this new climate of cooperation. That is exactly what we're doing on all the fleets, we're doing it on MHP and all future acquisitions. We will procure multi-year service support contracts, and that will provide us a better life cycle cost.

As I mentioned earlier, the life cycle cost is the huge piece. The cost for in service support on new weapons systems that you will keep for 20 years will probably be 75% of the program. In the past we focused on buying the new shiny

piece and lived with the difficulties when got it into service. Now, we're focusing on service – big change, big shift in the program, and a shift for industry. In my view it is a better shift, one that will create a team approach to producing the product.

Another innovative aspect is our integrated product teams. Whereas before we would be separate entities over the boardroom table, we now work as a team on a regular basis. If the industrial team sees ways to improve the system, or our folks at wing level see a modification that can enhance the reliability of the asset, we can put that into the mix and work out a solution as part of the two teams, and then share in the benefits.

Obsolescence will also be covered in the contract. Industry will make the modifications and any required upgrades to maintain the operational capabilities of the system as part of the original contract.

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### How is industry responding to such changes?

It's a learning phase. I think they're very positive about it, they want to get in. We're finding that both parties are very motivated to do it. Once you get into the detail level, a significant number of legal, liability, and risk issues need to be worked out. For example, the value of the Canadian dollar in 10 years from now, or the US exchange rate. How much risk do you have to build in? In my view that's the kind of discussion that you need to have up front, and then you build mechanisms into the program accommodate such issues.

We're out of the parts business, we're going to let the company do the parts business. We'll make sure that everything is in place, but you're going to buy the parts, you look after the manpower, manpower is not our issue. And what we'll do is monitor and track what you're doing, and that will be the basis that you'll get your performance benefit. So if you do really well, there's going to be more cash in the bucket for you. And of course, for industry, that's exactly what they want.

And my famous saying is: "best of breed, globally competitive." So I tell industry: 'let's set up a program, that we'll be the best, and I can go to any of the other foreign nations (I deal with the Americans, and the Australians and the British and the New Zealanders and the Germans and the French...)' and I'll be able



PHOTO: SGT FRANK HUDEC, CANADIAN FORCES COMBAT

**Captain Roch Ouellet (foreground), a tactical navigator with 405 Maritime Patrol Sq, works in the tactical compartment of a CP-140 Aurora.**

to tell them that can I overhaul my aircraft faster and at less cost than they do. And they'll come and look for business with these companies. I can tell you it's happening right now in Mirabel, on our CF18, we've optimized a program with L-3 Communications MAS to overhaul parts on the wings of the CF18 and the Australians are here right now looking at this process. They're looking at sending their wings from Australia to Montreal because they can ship them that far and overhaul them cheaper and get them to a better quality and standard than they can do in Australia at this point in time.

Another good example is IMP (Industrial Marine Products) in Halifax working on our Aurora and our Sea King. The expertise developed for those projects is now being sought by the U.S. Navy.

It's one of the ways that I'm selling the program to industry. This concept of "you become best of breed, I'll help sell your program, and you will become globally competitive and pick up additional business around the world" has real synergy.

That's why I think it's so exciting, and I'm pressing all the time. OWSM is a tremendous program. It's going to save a lot of money, increase operational capability, allow us to reassign manpower, and it's going to make Canadian industry more globally competitive.

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## How has your staff accepted the change?

From my perspective, OWSM has been a bit of a struggle, because you know, when you deal with an organization of this size, and you tell people that some of them are going to be changing their jobs, or you tell them that the way that they've contracted and written agreements in the past is going to change significantly, or that they'll be working in teams with industry – it's a change of culture, a change of attitude. So I won't diminish that piece of it, and that's a significant element to deal with. There's a large institutional cultural change that has to take place.

However, when I talk to most of the people, they're very keen to do it. Some of them are not sure *how* it's going to happen, so there's a bit of concern there, but on average, when you talk to the folks, they see it as a 'great idea.' We're driving in exactly the right direction.

So it's new ground, very new ground, but exciting. My guys are highly motivated, I'm pushing them hard to bring the solution. We should have the C130 in this year, we should have the CP140 (both the avionics and the air frame) in this fiscal year. We're working on the CF18 airframe program, we've got the avionics one in place – it was the original one we did and now we're going to optimize it. In fact, when I was a Director here, 6-7 years ago, we came up with this concept and drove it in place at that time it was very new, very novel. People were kind of reluctant. But it is becoming evident that it's one of the program models for the business.

Demands are going to be great, but as I mentioned, OWSM will help free up people within the division, and they be able to refocus on modernizing the equipment. So folks that are working on the CC150 now, or working on our air to air refuelers will be able shift over to work on strategic airlift. So there's a spin-off in doing this OWSM system – it's good for industry, it's good for Canadian industry. They should be jumping at this. And most of them are.

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## What other priorities are moving forward?

I can tell you the Fixed Wing SAR program is very active. There are some departmental issues we have to work through to integrate that package, but the team's very energized, up and running.

Everybody looks at some of these high level approval activities forget that underneath there's a large group of operational staff, engineering staff, and logistic staff that are busy writing all these elements that will become part of the contractual package. When you look at these binders behind me, those are the programs. They fill those pieces while we work the approval piece. I expect that we are going to get going very soon. When I say that, we're getting into some bigger governmental issues as we are all well aware... if we start to get that kind of change, we'll slow right down. But the motivation to move is strong, and the working level folks are pressing very hard.

And again, we're going to look at the long term service contract for that airplane. And it doesn't matter which one we buy, we just want to get a nice new one. I was working on the old 'Buffs' in the late 70's. I know the Buffalo's, they were great in their time, but they need a rest right now, they need to end up in some museums.

We look at uninhabited aerial vehicles that are going to move forward, we look at the medium lift helicopters, and the strategic airlift that are in the defense policy. Those three elements already have a small nucleus of teams looking at how we would shape and form those packages. So folks are already looking at putting these Optimized Weapons System Management principals into these new programs – we're fired up.

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## Are simulation technologies having much of an effect on your department?

Absolutely. Simulation Based Acquisition (SBA) is a very important and fundamental tool that we're just starting to build for the future. A great example is the new Jet Strike Fighter. They're not going to carry their missiles on the wings or the wingtips like you see on most airplanes now – they'll be in an internal bombay area. Simulation models of how a techni-

cian would physically go in there and mount or repair these missiles are actually changing and modifying the design of the airplane. Ergonomic people are created to do these type of maintenance actions and activities, and if there isn't enough space, or they can't get the wrench in, or they can't do certain things, they can actually modify the design of the airplane. And that's one situation that we're dealing with right now, but we're doing that on the whole design of the airplane to reduce the overhaul cost.

Another example is fuel tanks. That's a huge maintenance activity because they're all laced in. Using simulation modeling technologies, they're optimizing the design in concert with the maintenance.

So, it's moving. I would predict to you that it will be 3-5 years before this whole simulation piece will be front and center. That you won't do anything. We won't make any decisions on any activities without it, and it will start right on day one, right from the conceptual phase and you'll build it through.

Talking about simulation based modeling, I was just visiting Sikorsky. They are going to do our new Maritime helicopter program using a computer-based design and modeling system that is so integrated that it can translate engineering data directly into machine language which is automatically transferable to the manufacturing phase and is also used for the logistics system. It will be a huge centralized database that is in the right format and code for everybody.

Why is that so important? Most parts are manufactured offshore today. For instance, Bombardier is going to produce the new C series – it produces the executive jets and the CRJ. The majority of those parts are manufactured offshore. A failure rate (when the screw holes, etc. don't line up) of 10-15% was expected in the past, but today it's a non issue. Parts are manufactured around the world, shipped to Stratford, Connecticut where they fit them together. I asked the lead

*CF18 Hornets are presently undergoing extensive upgrade programs.*



engineer about the failure rate, and he said 'we haven't had one yet.' The new system builds are so precise, so exact, that it is amazing. It's a new world.

We are moving toward acquisition based modeling. I expect that in three to five years it will be almost totally electronic from concept to delivery and support. You'll make trade-offs in conceptual design and that data that will follow its way through the system. Right now we've got pieces that are automated, but we're not fully there.

### Final Comments?

I really believe that with the new defence policy statement, the new funds that have been provided to the department in my realm of responsibility of acquisition and service support, we are well positioned to drive forward. It's not going to be easy having this many programs all forging ahead.

It will involve a huge demand, in industry as well. Industry has to start manufacturing parts, find trained people to run equipment, new designers and engineers – these are specialized positions, this will be a big challenge too – but a good one.

We are well positioned to drive it forward. I've got a large staff. They know that things are on the move and that we have to deliver. They are really focussed on the future, and recognize this opportunity that we have not seen for 20 years in the military – and they are ready for it. **FL**

### Coalition Warrior Interoperability

*June 2005* – Previously known as the Joint Warrior Interoperability Demonstration (JWID), the Coalition Warrior Interoperability Demonstration, CWID, is an annual interoperability exercise sponsored by the U.S. Chairman of the Joint Chiefs of Staff. This year's objectives focus on deployable solutions that address the global war on terrorism.

The exercise will introduce first responders, intelligence analysts, military operators and combatant commands to new C4ISR technologies and interoperability solutions that can be tested and transitioned into operational use within 6-12 months.

The Canadian trials will also be made accessible to 23 participating coalition countries including the U.S., UK, New Zealand, Australia, and participating agencies and commands include NATO, US Department of Homeland Security, the National Guard, European Command, Naval Surface Warfare Center, Hanscom Air Force Base, the National Geospatial-Intelligence Agency, Space and Naval Warfare Systems Command, the Federal Emergency Management Agency, and the Federal Bureau of Investigation.

The Canadian National Coordinator is actively looking for CWID participants for 2006. The deadline for submissions is 30 Sept 2005. Visit [www.cwid.js.mil](http://www.cwid.js.mil).

### SOUTH AFRICA JOINS AIRBUS

*28 Apr 2005* – The South African government has signed a contract with Airbus Military to partner in the A400M airlifter programme. South Africa's industry will participate in design, engineering, industrialization, manufacture and in-service support of the A400M military transport aircraft.

The partnership agreement coincides with the launch of an initiative to develop aerospace manufacturing capabilities.

### Kit for Bomb Technicians

*21 Apr 2005* – Global CBRNE mitigation specialist Allen-Vanguard has developed a kit that facilitates access to buildings and the clearance of internal spaces. "The HAL Building Accessory Kit is an essential item of equipment for any bomb technician faced with a potential IED located in a building," said Roy Peers-Smith, President and CEO at Allen-Vanguard.

### IDELIX Software Inc. and Offshore Systems Int'l Ltd. Team Up

*8 Apr 2005* – A teaming agreement to support the integration of Pliable Display Technology by IDELIX into OSI command and control solutions. PDT will enhance geographic situational awareness within OSI products deployed at the strategic, operational and tactical levels.

## NEW AVIATION MUSEUM WING



*Ottawa* – The Canada Aviation Museum's new 8,200 sq m structure, designed as an aircraft storage facility, was officially inaugurated on Thursday April 14, 2005. In the

audience were local dignitaries, war veterans, museum officials and members of the Canadian aviation community past and present. To the crowd's delight, a Mitchell B-25 bomber staged a nostalgic flypast.

The new Wing will provide shelter for several aircraft, too large for the Museum's main public facility, that have been deteriorating outside for many years. It will also accommodate aircraft and artifacts from the main museum building, creating new spaces for public displays. Constructed primarily of steel,

the new Wing is a dramatic addition to the uniquely shaped Museum.

The next development phase will include a large conservation and restoration hangar to accommodate some of the Museum world's largest artifacts.

With an internationally renowned aeronautical collection, the Canada Aviation Museum, located at the intersection of the Aviation and Rockcliffe Parkways, is considered by many to be Canada's best aviation museum.

– Peter Pigott and Denis Legare