CSeries - Keeping the faith

By Mary Kirby
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Bombardier's most prominent pitchman has grown accustomed to being asked when the airframer will announce a launch customer for the Pratt & Whitney PW1524 geared turbofan-powered CSeries.

The query lobbed time and again at Bombardier Commercial Aircraft president Gary Scott by journalists and analysts alike is neither original nor sophisticated. And lately Scott has betrayed some of his exasperation at the clamouring of headline seekers. "I have little doubt that in the very near future we will be announcing additional orders and most likely we'll have the first operator in one of those announcements," he says.

To date Bombardier has secured 100 firm orders for the 110/130-seat narrowbody, yet no operator has agreed to take the first CS100, which is scheduled to enter service in 2013.

The Canadian airframer's recent sale of 10 CSeries - five CS100s and five CS300s - to Braathens Leasing for Swedish regional Malmo Aviation certainly breathed fresh life into the programme, which had languished without a sale for 15 months following Republic Airways Holding's firm order for 40 CS300s in February 2010.

But will the relatively minor order from Braathens for deliveries beginning in 2014 - and assurances from Scott that more orders are forthcoming - be enough to quell scepticism over the CSeries prospects to become a runaway success?

Will business boom for the CSeries airliner at Paris?

Industry observers and analysts are divided on the answer, because market dynamics have changed in the period since Bombardier last won a major CSeries order.

For starters, Airbus in December formally launched its Neo engine option for the A319, A320 and A321, offering operators a choice of either the Pratt & Whitney PW1100G - a variant of the same geared turbofan that will power the CSeries - or the CFM International Leap-X, together with "sharklet" wingtips, with the aim of being 15% more fuel efficient than today's A320 family aircraft. Deliveries of the A320neo are set to begin in the third quarter of 2015, with the A319neo following six months later.

With Neo defined, Airbus's chief salesman John Leahy unleashed his no-holds-barred assessment of Bombardier's prospects, saying: "There is virtually no business case left for the CSeries. It has the same number of seats, we have a wider fuselage, the fuel burn is similar and we offer 1,200nm [2,200km] more range."

NEO'S MATRIX

Even if Leahy's comments could be attributed to characteristic bluster, his words appeared prophetic when Airbus almost immediately started racking in commitments for the A320neo, including from Indian low-cost carrier Indigo, International Lease Finance and CSeries customer Lufthansa. Strong interest in the A320neo from myriad other operators was quickly expressed. Even Bombardier's largest CSeries customer, Republic, put down an $8 million aircraft place holder deposit with Airbus for the re-engined aircraft.

The A320neo could still destroy the CSeries, says Teal Group vice-president of analysis Richard Aboulafia. "Neo is aimed very clearly at that. It is not by accident that the CSeries was originally aimed at Airbus customers. It was meant to precipitate a reaction and it certainly did."

Bombardier Belfast will manufacture the complete outer wing of the CSeries

While the A320neo represents the most significant near-term threat to the CSeries, airlines have also been keenly watching and waiting for Boeing's next move.

Boeing has indicated it will focus its product development studies around an aircraft "modestly bigger" than today's 145- to 180-seat 737-700 and -800 for service entry in 2019 or 2020, a move that could prove fortuitous for Bombardier, as it would leave the 100- to 145-seat market unaddressed by the US airframer. Boeing says it retains the ability to re-engine the 737 if this new aircraft does not come together in the next nine months or so.

Embraer, meanwhile, has finally hinted at its own scheme for an E-Jets successor, saying any clean-sheet design is likely to be five-abreast, a configuration that would put the airframer squarely into the 100- to 149-seat territory being targeted by Bombardier with the CSeries.

Referring to Embraer's studies, Scott says: "What it says to me is that first of all they [Embraer] agree that the optimal cross-section for an airplane in the 100- to 145-seat market is five abreast

and so that's again part of the reason why [the CSeries is] 12,000lb [5,450kg] less than an [Airbus] A319. And secondly, I think they also believe, but are waiting for Boeing to confirm it, that Airbus and Boeing are going to concentrate above 145 seats."

At the same time, however, new narrowbody contenders from China and Russia, respectively the Comac C919 and Irkut MS-21 - arguably the most modern commercial aircraft seen from either country in decades - are giving airlines based in these fast-growing regions further pause.

As one long-time aviation industry consultant observes in reference to the CSeries' chances: "Being a first mover has only limited advantage in a dynamic market, and that window might very well have passed Bombardier by." Another industry veteran points out: "New versus evolved is a tough sell. The A320 is still a youngster compared to the 737, and neither is exactly dead."

But Bombardier is not ready to be counted out. The airframer is fond of telling the story of how it held a decidedly meagre orderbook for the Canadair Regional Jet when it introduced its first 50-seat CRJ100 in 1992 with Lufthansa CityLine.

At that time, Flight International reported that Bombardier's task in regard to the CRJ100 "is not to persuade airlines of the inferiority of the competition but, as 'the only game in town', to convince them that this particular game is worth playing at all."

In many ways, Bombardier faces similar challenges in selling the CSeries as it did with the CRJ, which - it is important to note - turned into a remarkable success story.

Bombardier is, quite technically, the only manufacturer offering to deliver a totally clean-sheet design aircraft optimised for the 100- to 145-seat small narrowbody segment complete with brand-new engines. But will lightning strike again for the company that put regional jets on the map? In short, can Bombardier convince the market that it even needs the CSeries in the first place?

Near flawless execution of its CSeries plan is now crucial for the airframer. The CS300 is to follow the service entry late in 2013 of the CS100, one year later.

At roughly half-way through its development phase on the CSeries, Bombardier can assure that it will deliver "on all the requirements we set out at the very beginning", says Scott, including a 15% cash operating costs advantage and a 20% fuel burn advantage over other current aircraft in its class; "unmatched reduction" in environmental footprint; and mature 99% reliability at entry into service. "It's truly going to be the game changer that we set out [for it] to be," he says.

The firm rightly boasts that the PW1525G geared turbofan it selected for the CSeries is excelling in ground testing. Pratt & Whitney will shortly send its second test example of the PW1524G geared turbofan to flight testing on its Boeing 747 testbed, rather than the third, because "the first one did so well that they decided to use the second one for flight tests, which is an indication of how well the engine development is going", says Scott.

But such success also bodes well for the PW1100G geared turbofan that will power the A320neo family, and which has so far won more orders to power the European airliners than its competitor, CFM's Leap-X.

Scott points to other recent successes in the CSeries programme, including the airframer's ability to pull some weight out of the aircraft after taking its all-composite demonstrator wing to ultimate load at its Belfast facility. "Limit load is the most you'll ever expect to see in flight and this wing has been tested to 150% of that and it did not break. You design to where maybe it should break to 150%, [and] it didn't break, so now that means we can take a little weight out. We overbuilt it. Engineers have a tendency to do that. And we also proved out all our manufacturing process," he says.

In another achievement, Bombardier mated a portion of the CSeries composite wing to the airliner's composite wingbox and conducted successful tests to mitigate any perceived risk associated with such a join. This is "the most critical part of the assembly process, and we proved all of that", says Scott.

At Bombardier's Saint-Laurent, Quebec facility, the firm has been pressure testing its CSeries aluminium lithium fuselage demonstrator, produced by programme partner Shenyang Aircraft in Dalian, China. "We now have 160,000 cycles so we're going to go to 180,000 cycles. That's three lifetimes. And we've learned a lot from that," says Scott. Final assembly will be undertaken at the company's Mirabel facility.

CERTIFICATION

Bombardier is also advancing with its certification efforts, and is elated that the CSeries will be certificated in China. Says Scott: "China is the number two market, right? Guess what, China wants to work with us and certify the CSeries in China. And so we recently added them with the agreement of Transport Canada to our certification team."

Bombardier has been somewhat less vocal about its strategic relationship with China's Comac, which is bringing the C919 to market. The two firms have decided to partner and explore commonalities between the Canadian-designed CSeries and the C919, but have yet to deliver a definitive plan for their co-operation.

But Teal Group's Aboulafia believes Bombardier should consider selling its entire air transport unit to China as "a back-up plan" should its prospects not brighten.

"The CRJ line is gradually fading out, and the CSeries remains an enormous gamble," he says. "Worse, Airbus's Neo is using the CSeries as a punching bag. With Airbus accelerating the A319neo and going after Republic [Airways Holdings], there's a risk the CSeries remains a marginalised product."

Scott responds: "We like our product line. We like our position in the industry. We like our future. We have absolutely no intent to sell."

Seeing the CSeries physically manifest before their eyes may be what is required for airlines. "I think part of the hesitation on the part of prospective customers is related to the fact that Bombardier is a new entrant in the bottom end of the large airliner market. The promises it is making are quite substantial. In a business environment where airlines are looking to cut every possible cost they can, that's sure to get their attention, but Bombardier hasn't even flown the thing yet," says Forecast International aerospace analyst Raymond Jaworowski.

Prospective customers include Qatar Airways, which has been in on-again, off-again negotiations with Bombardier for a possible CSeries launch order since 2008, and Delta Air Lines, which issued a request for proposals to replace 100-200 narrowbodies and pointed to the A320neo and CSeries as front-runners.

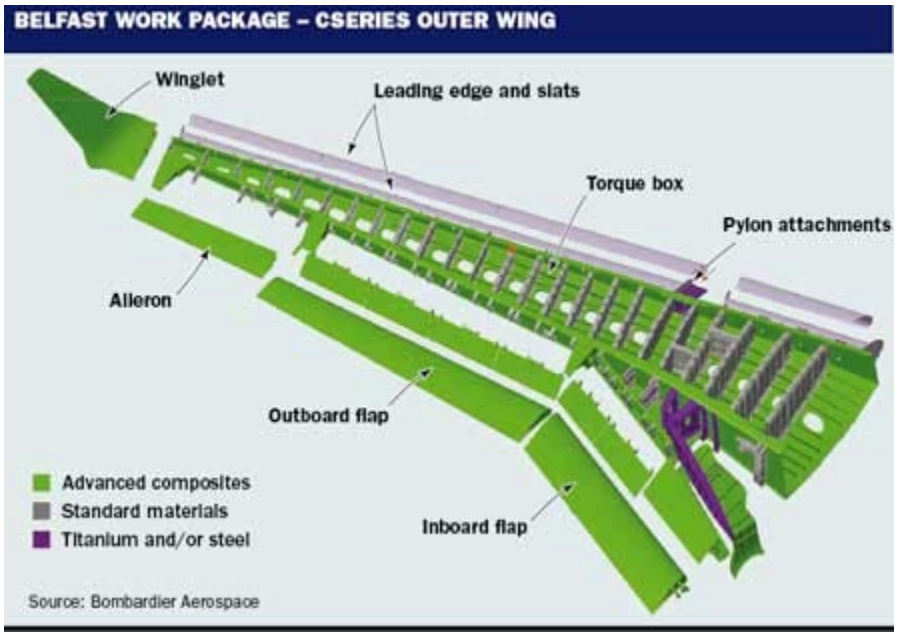
Winning even a slice of the Delta RFP is considered essential by analysts. The US major, with regional affiliates like SkyWest Airlines, represents Bombardier's largest operator of CRJs, the aircraft that put it on the commercial map.

Says Scott: "The CSeries is ideal for their network, so I'll be disappointed if they don't order some CSeries eventually, but does our programme depend on it? No. Are they incredibly important? Yes."

BELFAST'S NEW JIG RETUNES INDUSTRIAL FUTURE

Dominating Belfast's skyline and protected by preservation order, Samson and Goliath - the giant cranes that tower over the Harland and Wolff shipyard where the Titanic was launched a century ago - represent the city's mighty industrial past. On the Bombardier Aerospace complex next door, the finishing touches are being applied to a large but unprepossessing building that will shape its industrial future.

The composite wing facility is where Bombardier Belfast will manufacture the complete outer wing of the CSeries narrowbody, as well as wing skins and spars for the new Learjet 85 business jet. The 56,000m2 (600,000ft2) development on the former dockyards represents a £520 million ($842 million) investment - the largest in Northern Ireland. Expected to create 800 additional direct jobs, the factory will bolster the future of a business that has ridden out tough times since the Canadian company took over Shorts Aerospace 22 years ago and integrated it into its aerostructures supply chain.



During 30 years of the "Troubles", Shorts executives lived with a terror threat that affected daily life, scared investors and battered the province's economy. Just as Northern Ireland was emerging from those dark times a decade ago, Bombardier was hit by the aftermath of 9/11 and laid off hundreds of staff. While the Belfast operation is now back up to 5,000 employees and participating in more Bombardier programmes than any sister site, the importance of the CSeries to the future of the Northern Ireland subsidiary cannot be overstated.

With the first of three development phases complete - a 29,000m2 fabrication plant - Colin Elliott, vice-president of engineering, business and product development at Bombardier Belfast, is proud of the fact that it is "now real, flying hardware that we are producing". Belfast's responsibilities on the CSeries comprise the structural wing box, leading edge and trailing edge, as well as all moving surfaces including leading edge slats, flaps, spoilers and ailerons. On the Learjet 85 it will design and manufacture the composite wing skins and spars.

Although Shorts has been specialising in composite materials for 40 years, the CSeries wing represents a step-change in scale and made necessary the construction of the new factory. "Until now, the Global horizontal stabiliser was the largest composite part we made here," says Michael Ryan, vice-president and general manager of the Belfast site.

With volume production of the CSeries two years away, the new factory is still largely empty. However, equipment is beginning to be installed in the soon-to-be-complete second phase, including semi-automated jigs that will be used to assemble the primary structural components of the wing torque box, which Ryan describes as "another milestone that brings us closer to producing wings for the CSeries".

He adds: "The jigs are highly automated and will allow us to control the assembly of the wings with a high degree of precision."

Production of the first wings will begin later this year. One hundred years after the Titanic, the Canadian airframer faces its own icebergs between now and the CSeries' service entry, but Ryan and his fellow Northern Irish believe the wings can transport Bombardier Belfast and the whole province into a new industrial era.

URL: http://www.flightglobal.com/articles/2011/06/14/357550/cseries-keeping-the-faith.html