



New CAE engineering capability to reduce risk for prototype aircraft development

Image courtesy of Bombardier

CAE Augmented Engineering Environment™ to enhance design, system integration, flight tests, and service entry phases for today's complex aircraft

Prototype aircraft present a unique, high-risk development challenge. Now aircraft original equipment manufacturers (OEMs) have a new suite of tools to help reduce risks through key phases of a new aircraft's progression.

"CAE's Augmented Engineering Environment™ (AEE) leverages the company's expertise in modelling and simulation, systems integration, and testing of multiple generations of avionics systems. Our partnerships with many OEMs to develop training solutions in parallel with aircraft development have provided CAE an in-depth understanding of this dynamic environment," says Mark Soodeen, Head of New Business Initiatives for Civil Aviation Services at CAE.

The benefit of CAE's Augmented Engineering Environment to the OEM is the capability to identify and resolve integration issues as early as possible in the aircraft development program, minimizing more costly downstream risk. The AEE accelerates the cockpit design cycle by integrating control panels, avionics, all aircraft systems, a visual environment, and aircraft dynamics. Flight test time can be optimized via cockpit procedural evaluation, windshear testing, and aircraft operational evaluation in the simulator. And select certification tests such as head-up display and enhanced vision can be performed on the ground.

CAE has delivered full-flight simulators and other training devices and services for more

than 40 prototype aircraft. Elements of the AEE capability have been applied to the Airbus A340/A380 for flight test rehearsal and the Embraer E170 fly-by-wire control laws and aerodynamics models, as well as other programs.

Bombardier's CSeries Complete Integrated Aircraft Systems Test Aircraft (CIASTA) program will apply the full AEE capability to an engineering development simulator and a prototype FFS, as well as additional CAE engineering design and support services. The CSeries, which Bombardier estimates will consume 20 percent less fuel and be the "greenest" in its 100-149 seat class, is scheduled to enter service in 2013 with launch customer Deutsche Lufthansa AG. "CAE's modelling and simulation-based solutions will help us accelerate and enhance the efficiency of the CSeries aircraft development, all while reducing cycle time and overall costs associated with testing and validation," stated James Hoblyn, President, Bombardier Customer Services & Specialized and Amphibious Aircraft.

The CSeries engineering development framework will initially be populated with generic simulation models to evaluate system design and integration concepts. As supplier hardware and software become incrementally available, the generic models will be replaced with actual aircraft components.

"Today's commercial aircraft have a high degree of complex systems, not only in

the cockpit, but networked with real-time maintenance data and cabin crew systems as well. CAE understands the complexities of new aircraft development, the iterative updates, and configuration management challenges. We have the proven ability to integrate multiple supplier elements that use different computing languages, operating systems and interfaces," notes Soodeen.

"The AEE capability enables CAE to manage the test environment using a higher level of integration. This allows the aircraft manufacturer to concentrate their resources on aircraft development activities," Soodeen says.



Nathalie Bourque, CAE Vice President, Public Affairs and Global Communications (3rd from right), at the groundbreaking for Bombardier's CIASTA facility in Mirabel, Canada. From left to right: Mr. Jean Teasdale, Vice President, Real Estate and Commercial Services, ADM, Mr. Hubert Meilleur, Mayor of Mirabel, Mr. Guy C. Hachey, President and Chief Operating Officer, Bombardier Aerospace, Mr. Mario Laframboise, Member of Parliament of Argenteuil-Papineau-Mirabel, Mr. Benjamin Boehm, Vice President, Programs, Commercial Aircraft, Mrs. Bourque, Mrs. Denise Beaudoin, Member of the Provincial Parliament of Mirabel, Mrs. Madeleine Caron, Assistant Deputy Minister, MDEIE. (Photo courtesy of Bombardier)