

Civil Simulation and Training news



one step ahead

Issue no.24 Fall / Winter 2010

CAE to develop first simulators for new Airbus A350 XWB

CAE will design and manufacture two CAE 7000 Series full-flight simulators (FFSs) for the Airbus A350 XWB, representing the world's first FFSs for the new long-range aircraft. In addition, CAE will develop six CAE Simfinity™ A350 XWB Airbus Procedures Trainers.

CAE has designed, developed and delivered the world's first full-flight simulators for more than 40 new civil and military aircraft representing 16 different original equipment manufacturers (OEMs).

"Airbus customers expect the highest standards of innovation, quality, safety, efficiency and service in their training programs," said Jeff Roberts, CAE's Group President, Civil Simulation Products, Training and Services." He adds: "CAE has a long history of exceeding expectations, and we look forward to continuing this heritage by developing the first simulators and training devices for A350 XWB aircraft customers around the globe."

The first FFS for the A350 XWB is scheduled to be delivered in late 2012 to the Airbus Training Centre in Toulouse, France, where it will be used by Airbus to support aircraft training developments and certification, as well as for initial training of pilots for customers taking delivery of the aircraft. The A350 XWB FFS will be initially qualified to interim Level C regulatory standards. After final aircraft flight data is available, the simulator will be updated to Level D qualification standards – the highest fidelity for full-flight simulators. The location of the second A350 XWB FFS installation is to be determined. In addition, Airbus also holds an option for a third A350 XWB FFS and the agreement includes provisions for the placement by CAE of additional A350 simulators in its network as the market develops.

The A350 XWB FFSs will feature the industry-leading CAE Tropos™-6000 visual system and the CAE True™ Airport visual database update service, as well as a six-degree-of-freedom CAE True™ Electric Motion System.

The CAE Simfinity Airbus Procedures Trainers (APT) provide a fully simulated Airbus aircraft cockpit using the same Level D simulation model as the FFS. Touch-sensitive screens in a 3D spatial orientation display the cockpit environment in a 1:1 ratio. The CAE Simfinity APT has data display screens for the Captain and First Officer that show Airbus procedures tutorials, animated schematics, and virtual aircraft. Pilots train on normal and abnormal procedures through a free play simulation.

CAE to upgrade FFSs for Airbus



CAE Tropos-6000 image generators enhance the realism of pilot training through extensive use of satellite imagery, dynamic airport environments, advanced weather effects and a world database.

CAE has signed contracts with Airbus to perform a range of upgrades on Airbus-owned full-flight simulators (FFSs). CAE will update an Airbus-owned A300 FFS with a new host computer, interface, CAE True™ electric motion system and industry-leading CAE Tropos™-6000 visual system. CAE will also upgrade the visual systems on an Airbus-owned A380 FFS and two A330/340 FFSs with the CAE Tropos-6000 visual system and provide the CAE True™ Airport visual database service for all simulators. Each of these simulators is located at the Airbus Training Centre in Toulouse, France.

The CAE Tropos-6000 image generator includes special rendering features optimized to take full advantage of liquid crystal on silicon (LCoS) projectors to deliver unprecedented visual realism exceeding the requirements of Level D qualification. CAE's innovative auto-calibration features help maintain maximum uptime and reduce maintenance costs.





Innovation Every Day

CAE's extensive experience with 1st full-flight simulators assures lower risk and higher fidelity training for commercial aircraft operators

*Jeff Roberts, Group President
Civil Simulation Products, Training and Services*

One of the key reasons CAE sustains our global leadership in civil aviation simulation and training is the continuous innovation of our people. We are never satisfied, constantly seeking to enable our airline and flight training organization customers to further enhance safety and operational efficiency. We are always adapting, listening intently to what customers need, evaluating emerging technologies and best practices, and investing to develop solutions that help improve our customers' businesses.

Year after year, CAE wins the majority of open competitions for new full-flight simulators (FFSs) and visual systems. We are the preferred choice, in part, because our engineers continue to stay one step ahead in researching and developing emerging simulation technologies. In part because of CAE's track record for delivering on time, meeting specifications, and working with our customers to secure regulatory approvals. And in part because of CAE's superior worldwide support network, which applies its own types of innovations to improve customer service and cost effectiveness.

The recent selection by Airbus of CAE to develop the first full-flight simulators and other training devices for the new A350 XWB aircraft highlights CAE's ongoing commitment to aviation simulation technology leadership. Over the past two decades, CAE has designed, developed and delivered the first FFS for more than 20 commercial wide-body and narrow-body aircraft models, more than all other manufacturers combined.

The understanding we gain and working relationships we cultivate in producing the first FFS for a new aircraft not only benefit the initial operators of that aircraft in terms of lower risk and higher fidelity right out of the gate. These OEM relationships also enable us to more readily keep the simulators at our customers' facilities and at CAE training centres up to date with the latest aircraft and avionics configurations, enhancing realism throughout the long lifecycle of the FFS.

Right now at CAE, our software and hardware engineers are designing or producing the first FFS for the Airbus A350 XWB, ATR42-600 and ATR 72-600, Boeing 747-8, Bombardier CSeries, COMAC ARJ21 and the Mitsubishi MRJ. We recently produced the first FFS for the A380 and are delivering our initial Boeing 787 simulators on a parallel track with a competitor. As one example of the breadth of our technological acumen, CAE engineers are embedded with the Bombardier CSeries team, using the CAE Augmented Engineering Environment (AEE) to develop a virtual aircraft and other tools which will help reduce the schedule and development cost of the new aircraft.

The depth of expertise required to produce the first FFS for today's complex, multi-supplier aircraft is significant. Consider this: CAE has simulated, stimulated and integrated just about every avionics and aircraft system being flown in the commercial aviation market today. We have produced more than 1,000 simulators and training devices encompassing more than 130 aircraft types, including accurate representation of engines, flight management systems, avionics suites, and other systems.

Designing effective training equipment to Level D standards and beyond requires a thorough understanding of aircraft systems interdependencies and interfaces, aerodynamics and the proper responses to malfunctions and adverse factors such as severe weather. But a full-flight simulator is more than off-the-shelf components, regulatory minimums and procedures manuals. To enable the highest levels of crew performance, the FFS developer should understand airline customer preferences for how they operate their fleets. Understand how pilots fly. Understand how technicians maintain aircraft in the hangar. As well, understand how people best learn and retain their knowledge and skills.

CAE well understands all these elements because we train tens of thousands of pilots and maintenance technicians every year to the highest standards in our global network of training centres. Our day-to-day, hands-on training experience translates into development of ever-better simulation training equipment. Ever-better training programs. And ever-better training centre management.

Just as no two aircraft fly exactly the same, no two simulators are exactly alike. These sophisticated training tools do not lend themselves to a cookie-cutter, one-size-fits-all approach. It takes a tremendous amount of talent, expertise, experience and can-do spirit to develop solutions that enable the highest-quality aviation training. CAE is the only truly global company focused on simulation and training. Our focus, proven durability across decades, and portfolio flexibility can deliver the right combination of innovative products, training and services tailored to your business model.

Innovation every day is one of many ways CAE continues to deliver more training value to our customers for less. We believe aviation professionals trained on CAE equipment and in CAE training centres not only perform more safely, they also perform more efficiently.

Let's have a conversation about how CAE's innovation can help address your unique training needs.

Jeff

CAE's civil aviation training presence in Europe, Africa and the Middle East

Abu Dhabi

CAE Training Services

Amsterdam

CAE Training Centre
CAE Global Academy Amsterdam
(Nationale Luchtvaartschool)

Brussels

CAE Training Centre
CAE Global Academy Brussels
(Sabena Flight Academy)

Burgess Hill

CAE Training Centre

Douala

CAE Global Academy Doula, CAE-managed for the Ministry of Civil Aviation

Dubai

Emirates CAE Flight Training joint venture

Moscow

CAE training at the Aeroflot flight training centre

Paris

CAE training at the Air France flight training centre

Rome

CAE training at the Alitalia flight training centre

Sesto Calende

Rotorsim, joint venture with AgustaWestland



Cabin crew training launched in Madrid

Cabin crew training approved by AESA, the Spanish civil aviation authority, is now being offered at the CAE Training Centre in Madrid, Spain. CAE offers initial, recurrent and conversion training courses tailored to the specific requirements of airline customers as well as to self-sponsored individuals. All training is conducted by highly qualified instructors with extensive airline experience.

Courses meet the applicable European Community regulations for safety and emergency procedures training. The Initial Course covers aviation basic skills, regulations, human factors and crew resource management (CRM), health / aviation medicine / first aid, normal operations, safety, emergencies, survival, dangerous goods, and other topics.

CAE also offers cabin crew training at the CAE Training Centre in Amsterdam, approved by the Civil Aviation Authority Netherlands (IVW).



It's True ...

- CAE recently won orders for full-flight simulators from Air China (Airbus A330, Boeing 737-800), Korean Air (Airbus A380, Boeing 777-300ER), and a North American customer (Boeing 777).
- The Honeywell-CAE Training Alliance is now offering maintenance training courses for technicians in Europe, the Middle East, and Asia.
- The FAA has qualified CAE's Simfinity™ e-Learning for "no classroom" initial and recurrent helicopter ground school for the AS350, enabling pilots to reduce their time at the training centre.
- The first CAE 3000 Series helicopter mission simulator, an AS350 B2 model located in Phoenix, Arizona, has been Level 7 qualified by the FAA and Transport Canada.

CAE Flightscape project to help IATA identify safety hot spots

Flight Data Analysis Exchange service consolidates airline data to highlight trends at the regional, airport and runway levels

CAE Flightscape has a key role in a new aviation safety initiative; the Global Safety Information Center (GSIC), soon to be launched by the International Air Transport Association (IATA).

CAE Flightscape recently completed a prototype project as part of the Flight Data Analysis Exchange (FDX) which forms part of this new safety tool. The objective of the prototype was to prove the feasibility of consolidating flight data from multiple airlines into a single de-identified database to effectively present safety information at the regional, airport and runway levels.

More than 70,000 flights were processed by CAE Flightscape and IATA analysis experts, focused on Ground Proximity Warning System (GPWS) events and unstable approaches such as high rate of descent, late flap selection, excessive localizer deviation and others. Specific flight information such as the airline, flight crew,

aircraft tail number, and time of day is always de-identified.

Consolidating data from multiple airlines can highlight "hot airports" or "hot runways" in the regions evaluated – that is, airports or runways with a high number of events outside acceptable parameters. Once a specific weakness is identified, safety authorities can analyze whether the issue is related to air traffic or other airport operations, airline operating procedures, or other factors.

IATA's secure web-based Flight Data Analysis (FDA) Service is powered by CAE Flightscape's Insight™ software. The service provides a comprehensive suite of tools and expertise to leverage the value of airlines' flight data and improve safety and operational efficiency. Flight data is extracted directly from the aircraft's Flight Data Recorder (FDR) or Quick Access Recorder (QAR), then analyzed to highlight risk areas in daily operations. The information

can also be used to visualize specific flights through data-driven animation, as well as for adjusting training programs to procedures requiring additional focus.

The value of the FDA service is further enhanced by IATA's unique ability to share lessons learned across the airline community to increase global industry safety levels. The GSIC FDX project is expected to also enable consolidation of de-identified data from airlines which manage their own flight data analysis. (Each airline maintains full ownership and access to its flight data.) Airlines will be able to use the consolidated reports to compare their own performance against the group aggregates – for airports, runways and, where sufficient data is available, for aircraft types.

More information about the IATA FDA service is available at www.flightscape.com or http://www.iata.org/ps/intelligence_statistics/Pages/fda.aspx.

Chris Stellwag, Rick Adams, Heather Dane, *Editors*
Jimmy Tigani, *Graphic Design*

Reader feedback welcome: flightnews@cae.com

