Boeing, FAA Flight Tests Demonstrate New Capabilities for Air Traffic Management

Satellites enable precision control in regions outside of radar or radio coverage

Using satellite technology, Boeing [NYSE:BA] and the U.S. Federal Aviation Administration (FAA) completed the final in a series of three test demonstration flights over the Gulf of Mexico that could lead to increased operational efficiency, capacity and safety in remote or oceanic regions not covered by radar or controller-to-pilot radio communication.

The study is part of the Global Communications, Navigation and Surveillance System (GCNSS) program, jointly funded by Boeing and the FAA. The Boeing team, led by its Air Traffic Management (ATM) unit, includes Connexion by Boeing; Embry-Riddle Aeronautical University (ERAU), Daytona Beach, FL; Tectura Company, Tempe, AZ; and two Boeing subsidiaries: Preston Aviation Solutions, Melbourne, Australia; and Autometric, Springfield, VA. FAA partners in the program include Massachusetts Institute of Technology Lincoln Laboratory in Boston and Mitre Corporation, McLean, VA.

Utilizing space-based assets, the team was able to effectively establish precision surveillance and control of the test airplane in a region of the Gulf of Mexico in which radar data and direct controller to pilot radio communication are unavailable. The team demonstrated two-way controller-pilot digital voice communications and data transmissions; automatic dependent surveillance via satellite; and an uninterrupted transition between radar and offshore/oceanic air traffic domains. In addition, traffic, weather and other data was shared via a secure network connecting multiple locations around the United States, demonstrating the kind of common information network Boeing sees as a key enabler of the next-generation air traffic management system.

"GCNSS has tremendous potential for improved capacity, efficiency, and safety, not only in this region where air traffic is growing, but in other remote and oceanic environments," said John Loynes, GCNSS program lead, FAA.

The flight data and simulation data were shared real-time among several networked participants: ERAU, Dynamic Simulation Laboratory at the FAA's Air Route Traffic Control Center in Houston, Lincoln Laboratory, the Boeing ATM laboratory outside of Washington, D.C., the Connexion by Boeing^{SM} Enterprise Operations Center in Irvine, CA, and the Connexion test bed airplane flying over the Gulf.

The network provided a common operating picture to all participants so that real and simulated air traffic was visible to all. With improved surveillance and communication capabilities, simulated controllers were able to direct the aircraft around a simulated weather cell. Officials on the ground played the role of pilots of simulated aircraft and were able to follow a revised flight path around the test plane.

"The GCNSS program brings us closer to creating a network-centric operation adapted to the civil environment for air traffic management," said John Hayhurst, ATM president. "We're excited about helping build a new framework for the next-generation air traffic system with tangible benefits."

The FAA's GCNSS contract was awarded to Boeing ATM in July 2002. Its purpose is to explore and develop next-generation communications, navigation and surveillance and air traffic management concepts, and to evaluate the feasibility of integrating emerging capacity-enhancing technologies into the current National Airspace System. The program comprises three main components: large-scale systems integration, including overall architecture, a transition plan and cost-benefit analyses; simulation tools and model development; and a series of demonstrations to determine the feasibility of a global CNS system, a secure common information network and secure broadband communications architecture.

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