Advanced Technologies and Oceanic Procedures (ATOP)
ATOP System: Managing the Skies from Sea to Shining Sea

When the U.S. Federal Aviation Administration (FAA) wanted to replace its existing oceanic automation system with innovative next generation air transportation technology, a world-class team lead by Lockheed Martin met the challenge.

Today, oceanic routes managed by the FAA are guided by the Ocean 21 system as part of the Advanced Technologies and Oceanic Procedures (ATOP) initiative. Air traffic controllers in Islip, N.Y., Oakland, Calif., and Anchorage, Alaska, depend on this system — which received a full system technology refresh in 2009 — to safely reduce air separation between flights and enable airlines to reduce fuel and emissions on many oceanic flights.

Today’s Ocean 21 system provides air traffic controllers with state-of-the-art technology that yields significant benefits to airspace users. These benefits include Future Air Navigation Systems (FANS) to support automatic dependent surveillance. ADS-C supports reduced separation and the ability for controllers to handle complex traffic situations and grant pilot requests.

Lockheed Martin has unparalleled credentials in oceanic, en route and terminal air traffic management (ATM) systems. Our ATM teams have been supporting air navigation service providers such as the FAA for more than 50 years.

To address challenges unique to the ATOP initiative, Lockheed Martin teamed with Adacel, Airways New Zealand and Sunhillo to develop communication, navigation, surveillance and air traffic management (CNS/ATM) technology for operational use in the oceanic environment.

The ATOP solution stands alone in its ability to provide world-class, best-of-breed support not only for oceanic and transition airspace, but also en route airspace supported by radar and ADS-B surveillance.

Advanced Capabilities, Plus Unparalleled Systems Integration

The ATOP system’s features include all of the advanced capabilities necessary to modernize air traffic control (ATC) operations to increase capacity, efficiency and safety, while offering a scalable system to meet diverse airspace requirements.

These features include automatic conflict probe for aircraft-to-aircraft and aircraft-to-airspace conflicts with conflict resolution advice; incorporation of current wind data into aircraft trajectory modeling; trajectory conformance monitoring; electronic flight data (paperless operations); automatic dependent surveillance contract management; controller pilot data link communications (CPDLC); air traffic services inter-facility data communications (AIDC); integrated presentation of all surveillance information; and traffic load monitoring. These capabilities are packaged in an ultra-high availability architecture specifically designed to support non-interfering hardware and software maintenance.

The attribute that differentiates the ATOP system the most is the controller workload reduction that results form a proper integration of these various advanced capabilities. For example, a single mouse click to review, probe and prepare the clearance response to a downlinked CDPLC request for an altitude change; automatic uplinking of SIGMET information to affected aircraft with no controller intervention required; or an automatic uplinking of transfer of communications to an aircraft for the appropriate facility and radio frequency with no controller intervention required.

This high degree of integration is a result of the ATOP system being designed from the onset to support CNS/ATM standards such as FANS. In addition, this high degree of integration enables the controller to proactively manage airspace and be responsive to airspace user requests by eliminating tasks that in the past were time consuming.

For More Information

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