



Nav Canada leads global effort to keep planes safe; Satellites to cover 75% of Earth that is invisible to current radar

Ottawa Citizen

Mon Sep 22 2014

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Almost seven months after Malaysia Airlines flight MH370 vanished, Ottawa-based Nav Canada is announcing a global emergency tracking system to minimize the horror of more lost airliners.

The service is to be offered free worldwide to authorized rescue agencies beginning in 2018, potentially saving lives and search, rescue and recovery costs.

The move, announced Monday, is an offshoot of a planned space-based aircraft surveillance network called Aireon. The major partners in the joint venture are U.S. Iridium Communications Inc. and Nav Canada, the not-for-profit, private Ottawa company managing Canada's commercial airspace.

The chief intent is to vastly improve the ability to track airliners in remote airspace.

More than 75 per cent of Earth's surface is still invisible to air traffic controllers.

But the unsolved MH370 tragedy and the 2009 crash of Air France flight 447 into a desolate patch of ocean between Brazil and Senegal have highlighted the additional need for a no-fee, global emergency tracking service.

"The existing gaps in surveillance, particularly in cases of lost aircraft, became abundantly clear this past year," says John Crichton, president and CEO of Nav Canada.

"The tragic disappearance of MH370 prompted a worldwide urgency to look for solutions. Aireon's response amounts to a global public service offering Aireon ALERT universally and on a no-fee basis."

Because radar coverage fades when planes head out over oceans and mountain ranges, pilots and controllers often use high-frequency radio to communicate, what's known as procedural control. (The alternative is positive control - tracking via radar.)

But procedural control means controllers have to put bigger "safety bubbles" - lateral and vertical separation - around aircraft, since their exact, real-time positions can't be tracked until they reach radar-controlled airspace closer to shore and radar-tracking stations.

That additional space and time requires more fuel and other reduced efficiencies, which cost airlines untold millions of dollars.

An increasingly popular alternative is Automatic Dependent Surveillance-Broadcast, or ADS-B. Planes equipped with the technology can determine their own positions and periodically broadcast the information to air traffic ground control stations. But because it is primarily ground-based, even it has limitations.

Now, ADS-B sensors are about to be placed aboard a constellation of 66 low-Earth orbit Iridium satellites, enabling global, real-time tracking of airliners equipped with operational ADS-B transponders. It's anticipated Aireon will be capable of tracking 1,000 active targets within an airspace 2,000 nautical miles in diameter.

The biggest benefit will be more efficient and precise routing. Nav Canada estimates that will save airliners flying North Atlantic routes alone more than \$125 million annually in fuel costs and a resulting reduction in greenhouse gas emissions.

Air navigation service providers, such as the United Kingdom's NATS and the U.S. Federal Aviation Authority, are expected to subscribe to Aireon, headquartered in McLean, Virginia, says Crichton. Individual airlines might also contract the service to track their fleets, he says.

Nav Canada is committed to a 51-per-cent ownership stake in Aireon by 2018 at a cost of \$150 million. Air navigation services from Italy, Ireland and Denmark are minority partners.

"The Aireon system solves the problem, there's world wide-coverage," says Crichton. "It's a real game-changer."

The first of Iridium's second generation satellites with ADS-B sensor payloads are to be launched next year. The full constellation is to be in place by late 2017 and operational the following year.

Competing space-based ADS-B networks are planned by Thales Alenia Space and Globalstar.

Questions, however, remain.

MH370 was equipped with an ADS-B transponder, as are most commercial aircraft that fly oceanic routes. (The transponders are expected to be mandatory on all commercial airliners in coming years.)

But MH370's transponder, for unknown reasons, ceased functioning as the 777 was en route from Kuala Lumpur to Beijing on March 8. One possibility is that it was purposely turned off.

"That issue is still there," Crichton acknowledged in an interview. "The airlines and the pilots' unions have got to sort that one out. There are solutions to that," including tamper-proof transponders.