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## Researchers chase goal of nonhijackable plane

By Reuters

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### Can technology create a nonhijackable plane?

By 2008, European researchers aim to bring that vision closer to reality through an ambitious security program to combat on-board threats in an industry left reeling this week by a security scare that raised the specter of Sept. 11, 2001.

On Thursday, British police said they had foiled a plot to blow up aircraft mid-flight between Britain and the United States in what Washington said might have been an attempted al Qaeda operation.

Since Sept. 11, 2001, the idea that civilian planes can be used as weapons has taken hold globally, spawning increased security measures in airports around the world.

The researchers aim to create a "last barrier to attacks" on planes in flight.

Among the nonhijackable plane's features: computer systems designed to spot suspicious passenger behavior, and a collision-avoidance system that will correct the plane's trajectory to prevent it from being steered into a building or mountain.

The researchers are also investigating the possibility--although they say it is probably some 15 years away--of developing an on-board computer that could guide the plane automatically to the nearest airport, in the event of a hijack.

"You never reach zero level of threat, no risk," said program coordinator Daniel Gaultier of French technology group SAGEM Defense Securite, a unit of Safran. "But if you equip planes with on-board electronics, it will make them very, very difficult to hijack."

#### Smart plane

The 4-year, 35.8 million euro (\$45.7 million) project, called SAFEE or Security of Aircraft in the Future European Environment, was launched in February 2004. Among those taking part are aircraft maker Airbus, its parents EADS and BAE Systems, as well as Thales and Siemens AG. The European Commission is contributing 19.5 million euros (\$25 million).

Omer Laviv of Athena GS3, an Israeli company taking part in the project, said the system might be commercially available around 2010 to 2012.

SAFEE goes beyond the limited on-board improvements made since September 11 -- like reinforced cockpit doors and the deployment of sky marshals.

Proposed enhancements include:

- A chip-based system to allocate matching tags to passengers and their luggage, ensuring both are on board and removing the need for stewards to count passengers manually.
- Cameras at check-in desks and at the entrance to the plane, in order to verify with biometric imaging that the person getting on board is the same as the one who checked in.
- An "electronic nose" to check passengers for traces of explosives at the final ground check before boarding.
- An Onboard Threat Detection System (OTDS) to process information from video and audio sensors throughout the cabin and detect any erratic passenger behavior.

- A Threat Assessment and Response Management System (TARMS) to assemble all information and propose an appropriate response to the pilot via a computer screen located at his side.
- A Data Protection System to secure all communications, including conversations between the cockpit and ground control.
- A secure cockpit door with a biometric system that recognizes authorized crew by their fingerprints, together with a camera to check they are not opening it under duress.
- An automatic collision-avoidance system to correct the plane's course if it strays from a permitted trajectory.

In a Sept. 11, 2001-style hijack scenario, for example, the TARMS system would detect that the plane was on course to plow into buildings and use biometric fingerprint sensors to check whether the pilot or an intruder was at the controls.

"If there is a terrorist in control or the pilot is not aware of this (false) trajectory, the TARMS decides to avoid the obstacle so there is an automatic control of the plane," Gaultier said.

The avoidance system would also kick in if the pilot, despite verifying his identity, persisted in the false course. Given its complexity, the SAFEE project raises legal and ethical issues that are themselves a key part of the research. They include whether people will find it acceptable to be minutely observed by sensors throughout their flight, recording everything from their conversations to their toilet visits.

With help from sources including security agencies and behavioral psychologists, researchers are building a database of potentially suspicious traits for computers to detect.

"It could be someone who's using their mobile phone when they shouldn't be, or trying to light up a cigarette. But it could also be something much more extreme, it could be a potential terrorist," said James Ferryman, a scientist at Britain's Reading University who is working on SAFEE.

The sensitivity of the system could be adjusted depending on factors like the general threat level, he said.

Program coordinator Gaultier conceded the system could generate false alarms, but said the crew and pilot would remain in ultimate control, deciding if the threat was real.

#### **Who pays?**

The improved passenger surveillance, researchers say, will be an important advantage on larger planes such as the Airbus A380, capable of carrying 550 people.

They believe passengers will be ready to accept the trade-off of less privacy for the sake of greater safety.

"We have to show it's not Big Brother watching you, it's Big Brother looking after you," Ferryman said.

Researchers say it is too early to judge the price of kitting out a plane with SAFEE, but they are working closely with a user group including airlines like Air France-KLM.

The issue is part of a wider debate within the industry, with airlines calling on governments to underwrite security costs.

"Suicide terrorism is not an issue for the airlines, it shouldn't be their responsibility," said Philip Baum, editor of Aviation Security International magazine. "It is an attack, actually, against the state and it's part of a national defense, and therefore we need to fund this accordingly."

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