

Lightning bolts a risk for modern jets

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But technical experts, astounded like everyone else by the disappearance of an Air France jet in the Atlantic with the feared loss of 228 lives, say [lightning](#) alone could not have caused it to crash into the ocean.

Air France has said the A300-200 jet was probably hit by lightning as it passed through a violent storm on the flight from Rio de Janeiro to Paris on Monday.

But the airline's chief executive Pierre-Henry Gorgeon said it suffered multiple technical failures before falling off [radar](#) screens.

"A succession of a dozen technical messages" sent by the jet showed that "several electrical systems had broken down" which caused a "totally unprecedented situation in the [plane](#)," said Gourgeon.

"It is probable that it was shortly after these messages that the impact in the Atlantic came," he added.

Nearly every commercial pilot has a tale of coming through a lightning storm. The French national office for aerospace study and research (ONERA) says that on average a plane is hit by lightning every 1,000 hours.

"Lightning could cause a mechanical problem, it could pierce the [aircraft](#), but usually it can continue to fly," said Vincent Fave, an expert airline accident investigator told AFP.

Yves Deshayes, of the French national airline pilots union (SNPL) said a lightning strike could be damage a plane's communications and navigation systems.

"But in a plane the systems are doubled, even tripled, so a lightning strike that threatens the security of a flight, and even the state of the aircraft, is extremely rare," he said.

Deshayes suggested that a lightning strike could explain why there was no radio contact with the Air France plane, but nothing more.

"It is hard to imagine lightning hitting a plane and making it explode. It could cause a number of breakdowns, more or less serious, but to my knowledge there are no incidents of planes which were blown up by a lightning strike," he said.

David Learmount of Flight International magazine said aircraft are

designed to survive lightning strikes. But the disappearance of the Air France jet was a "chilling reminder that nothing is impossible, however unthinkable."

An expert on aircraft accidents, Francois Grangier, told AFP in a 2005 interview of his experience.

"In my career as a pilot I often experienced lightning as did all of my colleagues. It's something which is often impressive, it makes a lot of noise in the aircraft and usually electrical power fails, but it's just as if it happens at home: the fuses jump, you put them back and everything works."

Usually, the electrical impact spreads across the surface of the aircraft "along the external skin, in aluminium alloy which is a very good conductor of electricity, and the fuselage and wings act as a Faraday cage."

Under the Faraday phenomenon any external metallic frame prevents lightning from traversing the structure.

However, aluminium is giving way increasingly to composite materials based on carbon fibre and resin. Manufacturers are making increasing use of these materials because they offer weight, and therefore fuel, savings.

For example, Boeing's new generation 787 Dreamliner depends on extensive use of such materials.

But composite materials are less effective in deflecting lightning and manufacturers have turned to another way of providing a shield.

They use the 'metalisation' of the aircraft: a kind of mesh is added, a

superficial layer which acts as a Faraday cage and in this way the aircraft is protected.

In recent years, at least two air crashes are believed to have been caused by lightning.

On June 22, 2000 a bi-turboprop Yun 7 belonging to the Chinese carrier Wuhan Airlines was hit by lightning, according to the Chinese authorities, as it approached Wuhan airport. Forty-two people on the plane and seven on the ground perished when the plane crashed into a boat.

Lightning is also suspected in the crash of a Kenyan Airways Boeing 737-800 on its way from Abidjan in Ivory Coast to Douala, Cameroon on May 5, 2007. It went down in a violent storm and all 114 people on the plane were killed.

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