IN SEARCH OF THE MISSING PLANE

Air France Flight AF 447

On 1st June 2009 Air France flight 447, a scheduled passenger service from Rio de Janeiro (Brazil) to Paris (France), went missing over the Atlantic Ocean. Onboard were 228 people. The aircraft left Brazilian radar surveillance at 01:48hrs. Messages from the onboard aircraft communications and reporting system (ACARS) maintenance system were received between 02:10hrs and 02:14hrs, with five FLR (failure) and nineteen WRN (warning) reports indicating that airspeed sensors were giving inconsistent readings and the autopilot and auto-thrust systems had disengaged. The final message was a cabin pressure (vertical speed) warning at 02:14hrs from location 3° 34' 40"N 30° 22' 28"W.

The airspeed sensors mentioned in the FLR and WRN reports, the probable cause of the accident, are called Pitot tubes and were invented by the French engineer Henri Pitot in the early 1700s. French scientist Henry Darcy modified their use to assume its modern form in the mid-1800s: they are most widely employed to determine the airspeed of an aircraft.

The Pitot tube basically consists of a tube pointing into the direction of flight. As the tube is open only at its front end and there is no outlet to allow airflow to continue through it, moving air is brought to a standstill and pressure builds up. This is the stagnation pressure of the air, known particularly in aviation the ‘Pitot pressure’. From this the airspeed can be determined.

Though widely used, Pitot tubes are vulnerable to water and frost; they have to be covered when parking or de-icing an aircraft, and have been the cause of other previous accidents. It might be wondered why aviation engineers still place their confidence in a principle more than three hundred years old; it should be possible to calculate aircraft speed from GNSS data available onboard and to correct these for head or tailwind, or at least to use the GNSS data to verify readings from the Pitot system.

The photographs show a group of marines recovering debris from the missing Air France jet in the Atlantic Ocean on 8th June 2009, a week after the plane disappeared from the radar. A similar search is conducted of the Yemenia Airbus 310 that crashed in the Indian Ocean, near the Comoros archipelago, on 30thJune 2009.

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