

Why some air crash investigations remain mysteries of the deep

March 11 2014, by Sidney Dekker



More than 100 vessels and aircraft from eight countries looking for missing Malaysia Airlines flight MH370, which disappeared on Saturday with 239 people on board. Credit: EPA/Ahman Yusni

The missing Malaysia Airlines flight MH370 has some similarities to the disappearance of [Pan Am flight 944](#), which disappeared into the Pacific Ocean almost 50 years ago.

Late in the afternoon of November 8, 1957, the propeller-driven Boeing 377 vanished, with no distress call heard from the pilots.

The plane was on its first leg of a round-the-world journey that began in

San Francisco. Its next stop would have been Honolulu but the [airliner never arrived](#).

The biggest air-sea search since the vanishing of [Amelia Earhart](#) was launched, but even with those resources it took days before floating bodies and some debris was found.

The missing Malaysia Airlines flight

Things are quite different in 2014 with the [disappearance](#) of Malaysia Airlines flight MH370 on Saturday.

A [Boeing 777](#) is a lot bigger than a [Boeing 377](#). The water in which it disappeared is not as deep as the Pacific. The Boeing 777 has emergency locator equipment on board that sends out signals for weeks, which helps locate the wreckage.

And once they are found, the various onboard recorders carry a vast electronic footprint of hundreds of flight parameters, offering a second-by-second story of the position and trend of many of its systems and components.

This is why the vanishing of a big jet in 2014 is so befuddling. Virtually all jet airplanes lost to the sea since the 1950s (the start of the jet age) have been found, if not recovered.

But it can take a while. The world is still a big place – and 70% of it is covered in water.

Discovery takes time

It took two years to locate the main wreckage of [Air France 447](#), an

Airbus jet that [disappeared](#) into the Atlantic in 2009 between Brazil and Africa.

Adam Air, a Boeing 737-400 carrying 102 people, [vanished](#) over Indonesian waters between Surabaya and Manado on January 1, 2007, taking all lives with it. Its fate, too, remained a mystery for a while.

It took a week for an Indonesian ship to detect metal on the sea floor, but that was not necessarily conclusive. It took another two weeks for the US Navy to pick up signals from the plane's recorders, and seven months for the recorders to be actually recovered.

The wreckage is still on the sea floor. The final investigation report concluded that the pilots had become occupied with trouble-shooting their inertial navigation system and, after the autopilot inadvertently disconnected, lost control of the aircraft.

Looking for clues



A Malaysian coast guard ship during search and rescue operations for a missing Malaysian Airlines flight off the coast of Malaysia. Credit: EPA/Malaysian Maritime Agency

The clues that were recovered from the Pan Am 944 accident give some indication of the sorts of things that investigators might be looking for when they eventually do find Malaysia flight MH370.

In Pan Am's case 19 bodies were recovered – 14 of them were wearing life vests but no shoes. This suggested that some preparations had been made for ditching.

Fragments of the fuselage indicated that the plane hit the ocean with the nose slightly down and the right wing lowered. Several of the recovered bodies showed impact trauma, but most died from drowning.

This suggests that 944's final plunge into the sea was not completely uncontrolled. This was supported by the finding that the wreckage had burn marks but only above the waterline. It indicated a post-crash fire: there was no evidence of a fire in flight.

Finding the 'eureka part'

We go to these lengths of investigation because we not only want to find the jet—we want to find out what went wrong. We need to find the "eureka part" that helps us to know why it disappeared.

But even when we find the jet, and the recorders, and we come up with a reasonable explanation, some mysteries will never be solved.

Despite meticulous investigation, many crashes contain irreducible

uncertainties that niggle away at investigators and nourish conspiracy theorists alike, even when there is broad agreement on what probably happened. This is perhaps especially true of those aircraft that disappear into the sea.

Trans World Airline flight 800, a Boeing 747 classic that seemed to have [exploded or been ripped apart](#) in mid-air after take off from New York on its way to Paris and Rome in 1996, led to one of the most expensive investigations ever.

Pieces from the wreckage were painstakingly [reconstructed](#) into a semblance of the aircraft in one of the National Transportation Safety Board's hangars near Washington.

Yet the "eureka part" of Trans World Airline flight 800 was never found. The incident gave rise to a number of conspiracy theories:

- a light streaking towards the jet, was seen by some witnesses just prior to the explosion
- metal in one place seemed bent inwards and then outwards, pointing to a hole created by an external projectile
- microscopic traces of pentaerythritol tetranitrate [PETN](#), a compound used in plastic explosives, were found on a piece of flooring from the passenger compartment.

A conspiracy, involving the US Navy, a test missile, the FBI and a whole host of other agencies, would become one candidate explanation. The FBI said later that these traces were consistent with explosives [allegedly spilled](#) during a canine training exercise a few weeks before the crash.



Parts of the wreckage of the the Air France flight 447 found deep in the Atlantic Ocean. Credit: EPA/BAE

The chairman of the National Transportation Safety Board ([NTSB](#)) at the time, Jim Hall, [alluded to the challenge](#) to the reputation of his entire agency.

"What you're dealing with here is much more than an aviation accident because of the profile of the crash," he said. "What you have at stake here is the credibility of this agency and the credibility of the government to run an investigation."

Yet he would not be the first without a "eureka part" to show for his efforts. Or the last.

The debris from Pan Am flight 944 had been found 145km north of its intended track. A plausible reason for that has still not been found.

Malaysia Airlines MH370 might similarly not be found along its planned track. Perhaps the crew initiated a U-turn after discovering some problem that called for a return.

And even though the recorders and some of the wreckage of Air France 447 were eventually recovered from the deepest crevasses in the ocean floor ever, mysteries still remain.

Minutes before the Airbus hit the surface of the Atlantic, the [cockpit voice recorder](#) had the Captain instruct one of the other pilots: "alors tiens prends, prends ça."

In French, this [means](#) "take that, grab hold of that,". But "prends ça" can also mean "look at that". We don't know what he meant or what he pointed at, if anything. We will never know.

Questions are still being asked as to what caused TWA Flight 800 to explode and crash into the Atlantic in 1996. A group called the Flight 800 Independent Researchers Organisation ([FIRO](#)) is dedicated to helping official investigators determine the cause of the as yet unresolved disaster. There was even a documentary produced questioning the cause of the crash.

Some 47 years after the Pan Am 944 accident, a newspaper publisher and history professor are [still investigating](#) the causes of the crash, in which they lost dear ones or acquaintances.

If and when Malaysia Airlines flight MH370 is found, it may similarly keep some of its mysteries to itself.

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