Reliance On Dated Tech Won't Prevent Plane Crashes

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Somewhere at the bottom of the 28.4 million square miles of Indian Ocean lies the wreckage of Malaysia Flight 370, its passengers and the aircraft's flight recorders. No one really knows where it is, or what happened in the early morning darkness of March 8, 2014, when the aircraft disappeared from radar.

Half a world away and a year later, recovery specialists and investigators search near Le Vernet in the French Alps for fragments of Germanwings 9525, which slammed into the mountainous terrain on March 24, 2015. Flight 9525 impacted the ground with such energy that the Airbus A320-200 was essentially reduced to shards and fragments of metal. Fortunately, the flight recorders were found, but they were heavily damaged and almost destroyed.

Flight 370 disappeared from air traffic control radar about an hour after takeoff and began to deviate from its route shortly after the last communication to air traffic controllers from the flight crew. It was in peril within an hour of takeoff. Published sources claim that the flight was tracked by Malaysian military radar for about an hour after civil air traffic controllers lost contact, but there is no indication of radar tracking after the Malaysian military radar lost it at 2:22 a.m. local time. Although there were a series of interactions between the aircraft's onboard systems and facilities operated by the British satellite communications company Inmarsat for several more hours, the aircraft had long-since disappeared and perished at sea well before any investigators were able to reconstruct the radar and satellite communications history.

Flight 9525 similarly started to deviate from its intended flight plan when a rapid descent started shortly after the plane attained its assigned cruising altitude. Attempts by air traffic controllers to communicate with the flight crew were not successful. It was in peril as soon as the descent began. Only after the recovery of the voice and flight data recorders were authorities able to determine that the first officer had locked the captain out of the cockpit and set up the fatal descent on the aircraft's autopilot system.

In the case of Germanwings 9525, the flight recorders fortunately survived the incredible forces of impact with usable information that told investigators what happened. The mystery of Malaysia 370, however, remains locked up at the bottom of the ocean. In all probability,

Malaysia 370's recorders will never be found. Despite its final location in the ocean being pretty well known, it still took 73 years before famed oceanographer, Robert Ballard, and his technology found the Titanic.

Several questions have arisen about these two fatal crashes that illuminate the potential for technology to prevent similar outcomes.

For example, the fact that no one knows the location of Malaysia 370 is inexcusable in this day and age. Reliance upon radar to track aircraft — particularly on transoceanic flights — is absurd because radar is a technology of the past. Authorities, led by the United States, should insist that airlines equip their aircraft with active position reporting using global positioning satellite technology. GPS position reporting is used on many makes and models of cars and trucks. Many aircraft already have the capability of reporting GPS position. But it should be required by the Federal Aviation Administration of all airlines that operate into and out of the United States now. If the United States takes the lead, foreign regulators will follow. Had GPS position tracking been used by Malaysia 370, the peril would have been recognized earlier and a search could have been initiated perhaps before the airliner even crashed. Under the worst case scenario, the location of the crash would at least have been readily known.

Another aspect of both the Malaysia 370 and Germanwings 9525 crashes that should be addressed by technology relates to the continuing reliance on mechanical flight recorders. The recorders on Flight 370 are lost. The recorders on Flight 9525 were almost destroyed. It took almost two years for authorities who knew the approximate location of the crash to find the recorders from Air France 447 in the Atlantic Ocean.

These mechanical recording devices should operate as a backup to automated, computer-driven systems that initiate streaming, or telemetering, of voice and flight data to satellites and ground stations as soon as computers determine that an aircraft is in peril or when certain predetermined conditions exist such as engine failure. As recent crashes remind us, airliner peril can result from flight crew neglect, mechanical malfunction and even intentional conduct. Had a peril detection system been in place, investigators would have had valuable forensic data on what happened with Flight 370 from day one. Nor would they have had to wait almost two years to know what happened with Flight 447. And, finally, they would not have had to wait for days and worry about the possible destruction of the recorders on Flight 9525. All of the critical flight and voice data would have been preserved before the planes even crashed. This is not new technology. NASA has been telemetering data back to earth from rockets and manned spacecraft since before the Beatles arrived in New York City in 1964.

There are simply too many safety lessons lost or delayed by not utilizing intelligent systems to initiate streaming of critical data from an airliner in peril. The technology to implement such systems is available and should be developed and implemented.

With a peril-detection system in place, technology affords yet another opportunity to prevent or reduce the likelihood of crashes of airliners in peril. Once a peril alert occurs, control of the aircraft can be automatically taken away from the flight crew, which may be disabled, confused, under duress or unable to control the circumstance and the aircraft can be placed in a stable attitude and configuration until the situation can be assessed and corrected. Given the advances in unmanned aircraft technology or "drones," remote control of airborne aircraft from ground-based operators, at least within the military context, is now done routinely over long distances and at all hours. Think of the lives that could have been saved in the Malaysia 370 and Germanwings 9525 situations if a peril alert system had taken over control and given ground-based operators the opportunity to intervene and attempt a safe recovery. Likewise, Flight 447 might have been saved had ground-based operators been able to assume control over the aircraft after the flight crew became confused and aggravated the situation with an erroneous response.

These recent tragedies bear witness to failings in dated technology and the need to address the lessons that can be learned from these tragedies with current technology. None of the solutions proposed here require the invention of any new devices or break-through inventions. They simply require creative problem solvers to take existing technology and put it to work for airline safety and crash prevention. They also require the regulators charged with aviation safety to encourage the implementation of this technology and eliminate the decades-old practice of ignoring innovation and looking to the past to solve today's safety problems.