OUT OF SIGHT, OUT OF MIND

In the previous edition of HindSight I told you about transponder failure. Six months later, I still want to talk about it.

Having a flight in controlled airspace without a correctly functioning transponder is one of the most serious situations for Air Traffic Controllers. The source for this danger is the simple fact that controllers will be unable to see the actual position of an aircraft, whilst they would still be responsible for keeping it apart from other traffic.

Or, in other words, having an aircraft 'out of sight' for exactly those that need to know where these aircraft are. Unsurprisingly, this situation is one of the Top 5 safety priorities for the European ATM Network Manager.

A flight without a correctly functioning transponder can be the single point of failure to the entire mid-air collision protection system in aviation. A flight without a correctly functioning transponder means no surveillance for ATC using only secondary radar, no STCA and no ACAS. Peeling off your protection layer after layer is like peeling off an onion – sooner rather than later it makes you cry!

'But what's the problem?' some people ask. Surely it's the controller's job to keep their 'situational awareness' and detect promptly if an aircraft track suddenly disappears from their screen.

Some even go further in their assumptions. They consider that each failure of a transponder will be duly identified and properly managed by the Air Traffic Controller. Is this really possible? Such fundamental assumptions underpin various serious arguments for acceptable levels of aviation safety. But are they realistic?

You may recall the mid-air collision that happened almost 10 years ago over the Amazon, Brazil. The transponder of one of the aircraft involved stopped transmitting the Mode C altitude which rendered ACAS useless. This single fact removed many of the protection layers. This fact was not perceived by the pilots who were focused on solving issues relative to the performance of the aircraft. The investigation report also identified that "The ATCO 1 of sector 7 did not notice the information alerts relative to the loss of the mode C and did not take the prescribed corrective actions". So nobody identified it! How serious is an argument for safety which only relies on pilots or controllers identifying transponder failure?

Is this just a single case? It is not. Each year I see an incident or two involving a flight without a correctly functioning transponder in the sample of most serious incidents in Europe. Some are failures of the transponder, some are Mode C interruptions and some are controlled airspace incursions by an aircraft without an operational transponder. Almost all of them result in serious incidents with few if any barriers left other than Providence. What's telling is that in many of these cases, the inoperative transponder was not identified by the controller.

Detecting when an aircraft drops off your screen may have been a reasonable assumption years ago. Then, the number of aircraft in the ACC sectors was not as high as it is today and controllers were just taking care of safety without so many pressures for efficiency, environment…

At that time, what was on your screen was also in your head. If an aircraft suddenly disappeared, even if you were not looking directly at it, it was rapidly discovered by comparing the 'picture' in your head with what you were seeing on the screen. A favourite 'exercise' of the instructors during recurrent training in the simulator at the time was to sneak behind the screen, turn it off and ask you to recreate the situation picture. Try doing that with the current levels of traffic!

The fact of the matter is that, today, the assumption that a transponder failure will be identified on time by the controller is no longer valid unless there are reliable tools to provide you an alert. By this I mean tools that provide active alerting and are not just a record in a table or a list that is hidden from your regular scan.

Today, transponder failure, without a system support for detection, can be confidently described by the old phrase "out of sight, out of mind".

Enjoy reading HindSight! S

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