

CALLBACK

From NASA's Aviation Safety Reporting System



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AUTOFLIGHT ASSOCIATED LOSS OF SITUATIONAL AWARENESS

ASRS continues to receive reports in which Flight Crews appear to focus on the autoflight system to the extent that situational awareness is reduced, sometimes during critical phases of flight. In the following reports, awareness of the aircraft's actual flight path seems to have been compromised by:

- Attention to programming the autoflight system
- Assumption that the autoflight system is accomplishing the desired task despite input or mode errors
- Failure to reference other visual cues or raw data

In many of these reports, workload, confusion, unexpected situations, distractions and fatigue are seen as factors that may exacerbate autoflight related issues.

Autoflight human factor issues are a particular concern when both pilots lose situational awareness. This may occur with greater frequency as flight crews are trained primarily or exclusively in the more passive task of autoflight system management. ASRS reports suggest that the ability to maintain real world awareness can be eroded by over-reliance on the highly dependable programmed control of the aircraft. With that in mind, perhaps the following incidents should be viewed as the result of human nature rather than human error.

TELLING IT LIKE IT IS — ONE CAPTAIN'S OPINION

A confusing departure chart and what the Captain characterized as over-reliance on automation resulted in a track deviation and traffic conflict for this air carrier Flight Crew. The Captain elaborates on his assessment of automation dependency and cluttered charts.

■ *Two major points here: 1) I'm tired of flying around with people who are predisposed to let LNAV and automation lead them around by the nose and, 2) charts have gotten ridiculous....*

It was the First Officer's leg. We were late, but I really try to provide a laid back, don't rush CRM posture. We did all the things we were supposed to do, but I guess we didn't spend 15 minutes reading every word on the NEWARK ONE 22L/R

departure page. This chart is a triple folded, 10-inch wide encyclopedia. The important piece of information is what to do on takeoff, yet it's practically hidden in a box towards the bottom of the page.... When you consider the congested airspace in that area, it's critical that you don't turn the wrong way after takeoff, but that's exactly what we did. Why we did that, I don't know. We're human I guess.

At 400 feet the First Officer said, "LNAV." I furrowed my brow...and thought, "Okay, maybe I missed something." But I went ahead and punched LNAV and looked down at the LEGS page on my side and saw LANNA at the top. I said something like, "That doesn't sound right." Meanwhile our VSI was pegged because we were climbing like a fighter since we only had twenty-some people onboard.

While we were in the right turn, obviously towards the wrong place...I'm feeling like this is not going well while the First Officer is climbing and turning right toward an aircraft crossing our nose from left to right. He's still a bit away, but...this looks like it's going to be unusually close. I say... "Watch that guy," pointing at the traffic, when I hear Departure say, "Did Tower give you a heading?" All my senses now tell me my first gut feeling was correct and I answer, "Ah, we're checking," while Departure rapidly rattles off, "Stop at 4,000 feet; turn left to 270; traffic 12 o'clock." I told him we had the traffic in sight and he says, "You guys need to be careful."

So, back to point number one. When I first was blessed to be a part of this fine group of pilots, the Captains I flew with all told me, "Never trust that box." And we didn't. We used our brains to fly the airplane. Now however, we bow to that thing! This is the second time this has happened to me and yes, of course it's "my fault," but both times it's because [pilots] just let LNAV lead them around. These are not RNAV departures, they are 'heading' departures, but we've brainwashed everyone to think, "Just hit LNAV and it will be all right." It's not. Please don't tell me, a "proper briefing" would've solved all this because we've reached briefing overload. [Pilots] are more worried about doing all the briefings than paying attention to actually flying the airplane....

The First Officer didn't see the traffic because he was face down in the instrument panel following the FD LNAV

guidance. When all this happened, his first reaction was to put on the autopilot and start reading the departure chart to see where we screwed up. I had to ask him to let it go until we got higher.

RED EYE WAKE UP CALL

Reports from the Captain and First Officer recount what can happen when both crewmembers of an air carrier jet focus their attention exclusively on the automation during an approach in IMC. Awareness of the aircraft's current flight dynamics (altitude, heading, airspeed, attitude, etc.) and of the pertinent aspects of the approach, appear to have become secondary notions rather than primary elements of flying the aircraft. Cross-reference to raw data is not mentioned in either report.

■ *We were flying a “red eye” and the weather [at destination] was approximately 400/1, drizzle and mist. The approach was properly briefed and all checklists complied with correctly. I was the Pilot Monitoring; the First Officer was flying. The First Officer had selected “Level Change” while descending.... When cleared for the approach... VNAV did not engage when selected. “Approach” was then selected. When I switched to Tower...we were told they had a low altitude alert. Not immediately seeing the problem, we elected to go around.*

[When I] looked at the flight director, both needles had been centered. I simply had not looked at how the approach had been set up on the MCP close enough. The First Officer later told me that the Level Change mode had remained selected, which explains why everything was centered and the aircraft was dutifully descending to the selected altitude of field elevation per the [final FMC] check. We executed a missed approach....

One thing I will include on all approaches in the future is a mental or verbal verification of the final approach fix crossing altitude at the time of crossing.

From the First Officer's report on the same incident:

■ *I cannot believe we both missed something so obvious, but we did.... We both looked at the approach and noted that VNAV wouldn't work since the intermediate fix had an altitude of 4,000 feet which we were already below. I then selected Approach mode and we both acknowledged approach mode.... We had previously intercepted the LOC.... Approaching [the Final Approach Fix] something didn't feel right and I started re-checking/cross checking the MCP*

when the “Low Altitude” alert was issued by ATC. We accomplished a missed approach at this point.

MANAGING THE AUTOMATION — MORE OR LESS?

An A320 First Officer's focus on managing the automation led to an approach deviation that prompted a warning from the Captain and triggered ATC low altitude alerts. Proper programming and proper use of the automation might have eliminated the problems in this incident, but errors can be made and systems can malfunction. Situational awareness will save the day (or the dark and stormy night).

■ *In the transition to the visual (backed up by the ILS), I thought I needed to cross [the Outer Marker] at 1,600 feet, placing the aircraft high on profile. I selected 1,800 feet/minute [descent] Vertical Speed to intercept the glide slope from above. As the Captain crosschecked he realized the aircraft was low on profile. At that time (approximately 1,600 feet), I disconnected the autopilot, arrested the descent, and maintained level flight until re-intercepting the glide slope (at approximately 1,400 feet).... Approach Control and Tower informed us they had received a low altitude alert.*

Spend more time flying the aircraft and less time managing the automation. Had I tracked the LDA course and flown a visual approach it would have eliminated a high workload in a time-compressed situation.

“WE WERE SUPPOSED TO BE DESCENDING”

It is interesting to note that situational awareness, in this case knowing that the aircraft was climbing when it should have been descending, was not mentioned by the reporter as an element in preventing future deviations. The B737-700 Captain focused instead on automation as the sole remedy.

■ *We were given clearance to descend to FL240.... As we began the descent, the VNAV would not engage. I tried entering a lower altitude so the VNAV would engage.... I thought we were all set and that the descent was occurring. I later noticed we had climbed from about 27,600 feet to 30,000 feet. We were supposed to be descending to FL240. After I noticed the aircraft level off, I used Vertical Speed to continue the descent.... We should have monitored our FMC entries better. This would prevent what had occurred.*

ASRS Alerts Issued in October 2013	
Subject of Alert	No. of Alerts
Aircraft or Aircraft Equipment	22
Airport Facility or Procedure	6
ATC Equipment or Procedure	3
TOTAL	31

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October 2013 Report Intake	
Air Carrier/Air Taxi Pilots	4,475
General Aviation Pilots	1,185
Controllers	647
Flight Attendants	358
Mechanics	175
Military/Other	116
Dispatchers	109
TOTAL	7,065