

CALLBACK

From NASA's Aviation Safety Reporting System



Issue 404

September 2013

AUTOMATION ISSUES

As autoflight system managers, Flight Crews are responsible for entering correct information into the flight management system, selecting the appropriate flight mode and monitoring the aircraft's compliance with the desired flight path. As pilots, Flight Crews must maintain situational awareness, stay ahead of the aircraft, use good judgment, make sound decisions based upon training and experience, and do whatever is necessary (within the constraints of good airmanship) to put the airplane where it is supposed to be. These responsibilities apply not only to air carrier and corporate crews, but with the growing use of automation, to general aviation pilots as well.

This *CALLBACK* presents a few recent reports in which Air Carrier Flight Crews and a General Aviation Pilot share some lessons learned regarding automation issues. In addition, an Air Traffic Controller's report shows that automation issues are not limited to aircraft systems.

Two Cases of Complacency

Proper use of the autoflight system requires that pilots stay "in the loop" and maintain a proactive stance in regard to "flying" the aircraft. The following two reports involve Pilots who did not stay closely engaged with what the autoflight system was (or wasn't) doing. In the first instance an ERJ170 Captain's report shows that when you mix fatigue with complacency, more than the crew's attention can go out the window.

■ *Cruising at FL350, fat, dumb, and tired, we were told to cross [a fix] at FL310. The First Officer was the Pilot Flying. He entered FL310 in the altitude window. We both pointed and confirmed. He entered the crossing restriction in the FMS. I confirmed and he activated. We both went back to staring out the window.*

I heard ATC tell someone to descend to FL310 and the First Officer and I simultaneously realized that we were less than a mile from the fix and still at FL350. He initiated the descent; I called ATC. The Controller...told us to descend and maintain FL310 and gave us a frequency change. I acknowledged and said thank you; he said no problem. The flight continued uneventfully.

The fact is that we flat out screwed up. We both thought we confirmed that we were in VNAV. We watched the airplane closely on the subsequent VNAV applications and it worked

fine, so I can only think we did not engage VNAV upon receiving the crossing restriction. We were both fatigued and had actually discussed taking coordinated naps about an hour prior to this happening, but neither of us did.... The simple fact is— we didn't operate the airplane properly.

When the automation is consistently working as advertised, monitoring becomes more of a challenge. It becomes easier for pilots to enter a reactive state of mind and unconsciously disengage from anticipating the desired flightpath. In this second case of autoflight complacency, the autoflight system went off track, but the A319 Flight Crew assumed everything was OK.

■ *Approach cleared us for the visual approach to Runway 22L via direct to the Final Approach Fix. We inserted "Direct" to the fix in the box and verified NAV mode. Autopilot #1 and "APPR" modes were selected to intercept the localizer and glideslope at the Final Approach Fix. We were at 7,000 feet, the glideslope intercept altitude, three to four miles outside of the fix and east of the centerline for 22L. As we proceeded, still in NAV mode, the airplane remained left of a direct path to the Final Approach Fix. Both pilots were watching outside the aircraft. We were still tracking towards 22L, but not tracking to the fix anymore. Tower asked us to verify that we were landing on 22L. We acknowledged that we were. It was at this point that we saw we were going to intercept the 22L centerline inside of the final approach fix rather than at the fix. We landed without incident on 22L.*

We intercepted the LOC inside of the final approach fix instead of at the fix as we were cleared. We as a crew assumed the automation was doing what it was supposed to be doing. Being that we were cleared direct and the aircraft was confirmed to do this, we did not think the track was drifting off course (15 miles away). I have never seen this happen, but I will be more aware even in visual conditions.

Distracted and Dependent

Historically, distraction has been an element in many aviation incidents and accidents. Now, with the prevalence of automation, pilots are less actively engaged in flying the aircraft and it may well be that they are even more susceptible to distractions.

An Air Carrier First Officer reported how a cockpit conversation, when combined with autoflight dependency, was enough to adversely affect their flight.

■ *ATC cleared us to cross [a fix] on the arrival...at the expected, planned, and standard FL230. Our altitude was FL270. The Captain and I were talking. The fix started flashing indicating station passage. I recorded the fuel on the dispatch release and then realized that I had not begun descending. I told the Captain I had forgotten to descend and reduced power to idle, full spoilers, and adjusted vertical speed to 3,500 feet per minute. As I began descending, ATC told us to change to Center. We were 4,000 feet above our crossing altitude and leveled at FL230 five to six miles after the fix.*

It was a quiet morning with conversation on the flight deck to keep our minds active. My error as the flying pilot was not initiating the descent when assigned by ATC, not perceiving the [glideslope] guidance in my scan, and the Captain not catching my error in his monitoring cross check. I should, as I usually do, begin descending immediately when assigned crossing fixes. I should, if planning a three-degree descent, ask the Captain to remind me if he sees me not acting at the descent point. I should be aware that conversation, though good in keeping the mind active, also leads to distraction from flying responsibilities especially during low levels of activity and when the automation is “flying.”

“I Was Depending on My Autopilot...”

A BE35 Pilot interrupted monitoring the autopilot to deal with a radio problem. Fortunately, an Approach Controller wasn't distracted from the responsibility to monitor the aircraft's flight path.

■ *Approach Control descended me to 3,000 feet. My heading was 160 degrees. I was told to maintain 3,000 feet and turn left to 060. I was depending on my autopilot to maintain my altitude and make the turn. The radio transmission from Approach was weak and barely audible. As I tried to ascertain the problem with the radio by turning the volume up and down and tapping on the radio, Approach Control said, “What are you doing? Where are you going? What altitude are you supposed to be at?” I then noticed that my altitude was approximately 2,000 feet. I stopped the descent and asked Approach, “What do you want me to do?”*

Approach gave me a left turn to 040 degrees, a right turn to base leg, and then a turn to final....

In a telephone conversation with ATC after landing, I was told that I had busted the assigned altitude and had come within 100 feet of another aircraft.

An Embarrassing Reliance on Automation

Pilot training in manual backup procedures is crucial to maintaining flight safety when aircraft automation malfunctions occur. The following report from an Approach Controller points out that training in manual Air Traffic Control procedures is just as important for Controllers who can also become over-reliant on automation.

■ *While working north departure, the ARTS (Automated Radar Terminal System) interface with all adjacent facilities failed. I first noticed that the next sector wasn't taking my handoffs and then all departing aircraft began to flash “DM,” indicating that a FDIO (Flight Data Input/Output System) “departure message” was required. I informed the Controller-In-Charge immediately. All aircraft had to be manually tagged up, departed in the FDIO, and handed off to the next sectors. All arriving aircraft had to be manually handed off to us from Center. The fact that the interface failed isn't necessarily the problem. The complete lack of expeditious handling to fix the problem was the greater evil, as the situation did not get fixed until well into the mid shift. After asking several people involved, it seems the nature of the failure is still unknown and just seemed to “fix itself” hours after the failure.*

The situation was lucky in a way because it happened during VFR conditions when we weren't very busy. Had this happened during a busy push in IFR conditions, I believe that safety could have been compromised and efficiency would have been down the drain. It's not safe and our customers deserve much better. When things break, the people that fix them need to identify the problem and fix it. Either more training or better support might be needed.... Also, some recurring training on manual hand off procedures may be in order. It seems that automation is relied upon so heavily these days that some folks forget the trusty old 7110.65 (Air Traffic Organization Policy or “Controller Handbook”). That's embarrassing.

ASRS Alerts Issued in July 2013	
Subject of Alert	No. of Alerts
Aircraft or Aircraft Equipment	3
Airport Facility or Procedure	5
ATC Equipment or Procedure	4
Maintenance Procedure	1
Company Policy	1
TOTAL	14

404
 A Monthly Safety Bulletin from
**The NASA
 Aviation Safety
 Reporting System**
 P.O. Box 189
 Moffett Field, CA
 94035-0189
<http://asrs.arc.nasa.gov>

July 2013 Report Intake	
Air Carrier/Air Taxi Pilots	4,712
General Aviation Pilots	1,235
Controllers	878
Flight Attendants	389
Dispatchers	212
Mechanics	190
Military/Other	147
TOTAL	7,763