

CALLBACK

From NASA's Aviation Safety Reporting System



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The Tao of Flight Management

Following the Magenta Path

If Lao Tzu were teaching recurrent training, he might say,

Accept the wisdom of the FMC.

Let it find the way.

But if the course does not agree,

Don't be led astray.

This issue of *CALLBACK* looks at several ASRS reports in which flight crews were so “autoflight complacent” that they were unaware of significant track or altitude deviations until alerted by Air Traffic Control.

These reporters strayed before being reminded of the true meaning of flight management. We can avoid the same errors by accepting the wisdom of their teachings.

Blue Crew Misses a Cue

An FMC can do a wonderful job of flying a departure. It can also do a wonderful job of flying the wrong departure. This B737 crew missed the fact that the departure in the FMC was for the wrong runway and left flight monitoring up to... no one.

■ *Although I checked and briefed the departure, I failed to notice that the initial heading was incorrect for the current runway's departure (80 degrees difference).*

I chose LNAV for the departure and didn't see that the aircraft was turning to the wrong heading until queried by Departure Control. I need to crosscheck the FMC better and monitor the actual aircraft performance.

From the Captain's narrative of the same incident:

■ *Despite briefing until we're blue in the face, somehow a heading that we've both flown a thousand times gets thrown out of our aviation brains due to too much focus on automation. I have no idea when LNAV was selected, but it was and since the autopilot got turned on right after takeoff, the airplane started turning.*

Despite my feeling that something wasn't right, I didn't figure it out until ATC asked us where we were going.

This is what drives me nuts about this love affair with automation. No one's flying the airplane anymore.

“We Need To Be More Vigilant”

A crossing restriction was missed when the Captain of an Air Carrier jet was engaged in pre-approach chores and the First Officer relinquished control to an autopilot that was set in the wrong mode. In this case, the Captain caught the mistake before ATC intervened.

■ *We were level at FL190 and the First Officer was flying. Center cleared us to cross a fix at 6,000 feet. The First Officer started down (autopilot was not engaged in the Nav mode).*

I made my PA announcement to the passengers, got off frequency to pick up the ATIS and also to make my in-range call to the company. By the time I came back on, we were about four miles past the fix and descending through 6,600 feet. I noticed this and asked the First Officer where he was going. He said that he thought that he had the autopilot in the appropriate Nav mode. I think the problem was that nobody was flying the airplane. We need to be more vigilant about what is going on with the airplane.

“I Asked Where They Were Going”

Perhaps not a mid-life crisis, but certainly it was a mid-course crisis when this Flight Crew strayed off toward the wrong BETTY. It took the intervention of an alert Controller to get the crew back on track.

■ *[An aircraft] departing JFK climbing to 11,000 feet [had been] given direct BETTE from Departure Control and handed off to Center. The aircraft checked in climbing to 11,000 feet. I issued [a clearance to] 14,000 feet.*

The aircraft made approximately a 90-degree turn during climb. When I asked where they were going, the pilot stated they had been cleared direct BETTE by Departure. He said they had typed in BETTY (not

the intended BETTE) which caused the drastic turn off course. Further investigation on the BETTY intersection came up with [coordinates] in the vicinity of Taiwan.

This has happened on this route / departure out of JFK on other occasions as well. We have encountered other similar sounding fixes, nav aids and intersections causing wrong turns and deviations. The fact that today's aircraft databases are loaded with a worldwide array of fixes adds to the potential of numerous similar or same fixes.

Also, pilot awareness should have been better. [A] wrong fix / spelling that results in a large direction change should have raised some flags if someone was monitoring the course.

“Forceful” and “Valuable” Lessons in Autopilot Monitoring

The human task of system monitoring is made more difficult by the high reliability of today's automation. In the following two reports, the autopilot failed to capture an altitude and caught the pilots off guard.

In the first instance, a vigilant Controller stepped in to “save” a C-208 pilot who trusted the autopilot to make a low altitude level off.

■ I had just completed a long night of cargo flights. It was in the morning on my last leg into my home base. ATC was vectoring me in for a visual approach and told me to descend to 1,500 feet. I put 1,500 feet into the Autopilot and it should have leveled off at that altitude. For some reason it did not and I continued down to almost 1,000 feet without noticing. At that point ATC said, “Say altitude.” I noticed my mistake, started a climb, and responded, “Correcting to 1,500 feet....”

I had become distracted with something on my phone. In combination with mild fatigue this caused me to descend through my altitude without noticing. I would like to think I would have noticed before I hit the water, but maybe not. If it were not for ATC asking about my altitude this could have been a deadly situation.

This was a forceful lesson for me to keep unnecessary distractions in check while flying, especially during the

non-cruise phases and when fatigue may be a factor. This also was a good reminder to not become too reliant on the automation.

In the second report, an LJ60 crew followed the proper procedures for confirming their altitude assignment, set up the autopilot and even made the “1,000 feet to go” callout before they “decoupled” from their flight monitoring duties.

■ [We] picked up an airplane...after...some maintenance on the flap system. I took off, did the initial climb and turned the autopilot on.... ATC cleared us to FL220.

The Copilot and I were talking about what they did in maintenance. The Copilot called 1,000 feet to go. I confirmed it and checked that the Altitude Capture was armed.... When ATC questioned our altitude, we realized that we were climbing through FL230.

The Copilot questioned what happened to the Altitude Capture. I don't know if the Altitude Capture got disconnected or if there was a malfunction in the autopilot. If it got disconnected we never heard the disconnect tone or bell.

I learned a valuable lesson. Regardless of whether the autopilot was armed or not, I should have been monitoring the plane more closely.

“Just Where Are You Going?”

An EMB-175 First Officer confirmed the wisdom of the procedures in the acronym CAMI (Confirm and Activate; Monitor and Intervene) used in dealing with autoflight systems.

■ Climbing out...we were cleared direct to a fix. The Captain pointed the heading bug toward the fix then put Direct in the FMS. I confirmed and he activated. Three minutes later ATC asked, “Just where are you going?” I noticed that we had flown past the fix by three miles and that we were in Heading mode.

We were involved in checking the radar at the time due to the number of thunderstorm cells. While we got Confirm and Activate, we missed Monitor and Intervene in C-A-M-I.

| ASRS Alerts Issued in June 2011 | |
|---------------------------------|---------------|
| Subject of Alert | No. of Alerts |
| Aircraft or aircraft equipment | 7 |
| Airport facility or procedure | 6 |
| Maintenance procedure | 1 |
| TOTAL | 14 |

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| June 2011 Report Intake | |
|-----------------------------|-------------|
| Air Carrier/Air Taxi Pilots | 2936 |
| General Aviation Pilots | 937 |
| Controllers | 735 |
| Cabin | 344 |
| Mechanics | 149 |
| Dispatcher | 76 |
| Military/Other | 25 |
| TOTAL | 5202 |