

# CALLBACK

From NASA's Aviation Safety Reporting System



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## ASRS To Conduct General Aviation Weather Encounters Study



Weather-related accidents account for the majority of aviation fatalities and most of these weather accidents involve General Aviation aircraft. Since GA aircraft are not equipped with voice or data recorders, the specific causes for these accidents are often unknown. In order to develop preventative measures, it is therefore extremely important to gather insights and data from pilots who were involved in weather-related incidents.

In conjunction with the FAA, NASA/ASRS will examine a variety of GA weather encounter issues. Some of the factors to be analyzed include: VFR in IMC, icing encounters, unexpected ceiling and/or visibility issues, disorientation, loss of positional or situational awareness, loss of aircraft control, controlled flight toward terrain (CFTT), and severe turbulence. In short, any weather encounter that affects safety of flight will be analyzed. Contributing elements such as pilot experience, training, proficiency, weather briefings, and aircraft equipment will also be studied.

While most aircraft involved in weather encounter events reported to ASRS are expected to be light single and twin, piston-engine aircraft, all aircraft and rotorcraft involved in FAR Part 91 and 135 operations are to be included in this study— piston, turboprop, or jet.

The time frame for this effort is from April 2005 through September 2005.

In order to provide the level of detail needed to fully understand the hazardous situation and the factors affecting it, ASRS will begin contacting pilots who report general aviation weather encounters to request their voluntary participation in completing a written survey questionnaire. Reporter participation in the survey is strongly encouraged.

All identifying information (names, company affiliations, etc.) will be removed before the ASRS research data is given to the FAA.

To support FAA and industry efforts to improve awareness, knowledge, training, and procedures related to aviation weather, ASRS strongly encourages general aviation pilots who experience adverse weather encounters to report these incidents to the Program and to participate in the Weather Encounters Study.

### ASRS Alerts Issued in March 2005

Subject of Alert	No. of Alerts
Aircraft or aircraft equipment	12
Airport facility or procedure	9
ATC procedure or equipment	3
Maintenance procedure	2
Navaid or Airspace structure	1
Chart or Publication	2
<b>Total</b>	<b>29</b>

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### March 2005 Report Intake

Air Carrier / Air Taxi Pilots	2993
General Aviation Pilots	725
Controllers	34
Cabin/Mechanics/Military/Other	131
<b>TOTAL (new single month record)</b>	<b>3883</b>

# Automation

## Complacency



Way back in the days of the Wright Flyer and the Boeing 737-200, aircraft control was directly dependent upon real-time pilot input. The “pilot action – aircraft reaction” algorithm tended to reduce the possibility of distraction or complacency during aircraft maneuvering.

In today’s fully automated, glass cockpit environment, the pilot’s role has become more supervisory and the requirement for direct control input is diminished or absent. When automation functions reliably, as it does most of the time, it can induce pilots to be less alert in monitoring its behavior. As these recent ASRS reports illustrate, pilots must guard against distractions and automation complacency in order to ensure that the aircraft performs as directed and anticipated.

## Lessons from the Line

Altitude and track or heading deviations continue to represent a significant percentage of the incidents submitted to ASRS. In each of the following reports, the deviations resulted when automation failed to perform as expected. Each report also contains an **observation worth noting**.

■ We were cruising at FL350 when Center directed a descent to FL250. The Captain set the new altitude in the FCU and I pushed the Altitude button for a managed descent. We were discussing the arrival, weather, etc., when Center asked us what our assigned altitude was. I looked up and saw that we were still at FL 350. We began an immediate descent and Center then gave us a vector.... I know I pushed the Altitude button on the FCU.... My mistake was that I didn’t confirm a reaction from the airplane.... **The lesson is obvious, as it always is – never trust the airplane to do (or not do) something and be extra diligent to double check it, especially when tired, hurried, or late which seems to be the company standard anymore....**

■ ATC cleared us to cross five miles south of FIX at 13,000 feet. We were at 15,000 feet and the restriction was entered into the FMS. We began discussing landing data

and ended up crossing the restriction at 15,000 feet. ATC asked our altitude and we immediately descended to 13,000 feet with a rapid descent rate. The controller gave us a heading off the route.... **Our discussion distracted us from monitoring the aircraft’s response to our input....**

■ We were cruising at FL280 when ATC instructed us to cross 45 miles south of FIX at FL240. The Captain entered a crossing of 240 at FIX -45 in the FMS. It was verified and executed. I also verified that VNAV was still engaged.... Approximately five miles south of FIX, ATC called and asked what distance we were from FIX. The aircraft had not started the descent. I replied that we had just noticed the same thing and were in a rapid descent to FL240. **Monitoring changes of aircraft attitude should take precedence over all other activities.**

■ ATC instructed us to descend from FL350 to FL340. The pilot flying set FL340 in the auto-pilot altitude window. The pilot not flying verified it and saw the pilot flying enter the new altitude in the FMS Cruise Altitude page and then push the VNAV button. We both became distracted for a couple of minutes and then ATC radioed a repeat of our clearance. We realized that the aircraft had not begun to descend as programmed.... **We re-learned a lesson— it’s easy to become complacent with the automation.**

■ We were given a descent clearance from FL380 to cross FIX at FL350. The auto-pilot was engaged and programmed for the descent. By the time we realized that the aircraft had not started the descent, it was too late to make the crossing restriction.... **Lesson learned: you still have to keep an eye on the airplane.**

■ After leveling off at our cruise altitude, we were assigned a 290-degree heading to intercept the INTXN transition.... The auto-pilot was engaged and heading mode was active on the flight director. The heading bug was set to 290 degrees and the NAV capture button was pressed and illuminated to enable intercept of the course toward INTXN. A brief discussion about the approach charts ensued and ended with ATC advising us that we had passed through the INTXN transition.... For some reason the flight director did not capture and intercept the commanded course.... **We both should have been monitoring the intercept.... It is very important to stay alert.**

■ On descent, Center gave us clearance to cross FIX at 8,000 feet. The First Officer (pilot flying) used LVL CHG (Level Change) to select it and I visually confirmed this. I then looked away to continue filing a report in the ACARS. I believe the First Officer was putting away some of his charts. Then he made a comment that alluded to the fact that the airplane wasn’t doing what he asked to do. It was only descending at 500 feet per minute. By the time he caught this and corrected for it, we were going to miss the altitude restriction. I notified Center and they were not too pleased.... **Make sure the autoflight system is doing what you want it to do.**