

# FLYING LESSONS for April 16, 2009

suggested by this week's aircraft mishap reports

FLYING LESSONS uses the past week's mishap reports as the jumping-off point to consider what *might* have contributed to accidents, so you can make better decisions if you face similar circumstances. In almost all cases design characteristics of a specific make and model airplane have little direct bearing on the possible causes of aircraft accidents, so apply these FLYING LESSONS to any airplane you fly. Verify all technical information before applying it to your aircraft or operation, with manufacturers' data and recommendations taking precedence.

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## This week's lessons:

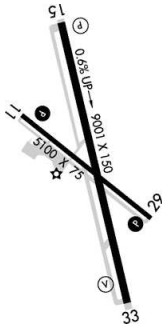
**You never know** when events beyond your control may impact the decisions you make.

Take this recent example:

A Piper Turbo Aztec with three aboard was in cruise flight when its pilot reported engine smoke. The pilot declared an emergency and diverted to Butte, MT, landing without incident.

Sounds straightforward enough. But look at the weather at Butte:

WEATHER: KBTM 2128Z 32015G25KT 1/4SM SN FZFG VV004 M04/M06 A2947



**Further, KBTM is surrounded** with high mountains; winds favored Rwy 33, which is 9000 feet long with a 0.6% downslope.

**Two engines. Turbocharging. Most likely** the pilot didn't worry much about overflying a mountainous area of 400 overcast, ¼-mile visibility in snow and freezing fog (read: rapid ice accumulation). Yet something unpredicted happened that forced the pilot to descend on one engine into that terrain-filled, icy mess despite the preflight assurances of two powerful "altitude" engines.

**I credit the pilot** with a job well-done, getting him/herself and the passengers down alive.

This experience reminds us all, however, to consider the possibility that outages or systems failures can occur any time. We should consciously decide whether to assume the risk of overflying icy or below-minimums weather, not accept it on the hope that we can cross with impunity. Ask yourself before you overfly adverse weather—if you have to descend, will you be up to the task? Could you have taken this Aztec single-engine through ice and mountains to a below-minimums, gusty landing?

**"Buttonology,"** the pilot interface with cockpit technology, is becoming a major part of flying airplanes. NTSB's recently released "interim factual report" on the April 2007 crash of an air-ambulance Cessna Citation II states:

Recordings retrieved from the airplane's cockpit voice recorder contained comments by the Captain, who was the flying pilot, that he was "fighting the controls". The first indication on the recording relating to "fighting the controls" occurred about 18 seconds after the FO [First Officer] called out "rotate", 11 seconds after the Captain called for the yaw damper, and less than one second after the FO acknowledged a turn to a heading of 050 degrees. Later in the recording, the Captain is heard to say "something is wrong with the trim"; "I'm fighting the controls. It wants to turn left hard" and "...she's rolling on me. Help me help me."

**The investigation has turned** to the possibility the FO inadvertently activated the autopilot shortly after takeoff, and that the Captain appeared to be trying to manually overpower the autopilot without realizing it was engaged. The report continues:

Initial examination of the radar data for the flight shows the airplane departing MKE [Milwaukee, Wisconsin] and executing a climbing right turn to a northeast heading. The airplane's initial climb lasted approximately one minute at which time the airplane leveled off for approximately 16 seconds at an altitude of 3,900 feet. The airplane then begins another climb at about 1,300 feet per minute. This climb lasted about 32 seconds at which time the airplane's pressure altitude was 4,400 feet. The radar data then showed the airplane in a descending left turn for the remaining 69 seconds of the data. The average descent rate during this period was 2,260 feet per minute.

All six aboard the Citation perished when the jet impacted Lake Michigan.

The airplane impacted the water approximately 243 knots indicated airspeed, 42 degrees nose down, and 115 degrees left wing down. No evidence of a pre-impact failure of either engine was found. Portions of all major structural and control surface components were accounted for during the examinations. No pre-impact failures of structural members of the airplane were identified. Examination of recovered components from the control system and autopilot systems were conducted.

**This was a highly experienced crew.** Both the Captain and the FO held airline Transport Pilot certificates and CE500/550 type ratings. The Captain had been a check airman on the Citation for two years, and had passed his most recent FAR 135 checks in the Citation about six weeks before the crash. The FO had been typed in the Citation for a decade. Both held valid first class medical certificates. *So it can happen to anyone.*

**Any time you hit a button** or engage a control, verify through all available means that the system is working as you expect. This is extremely important in the case of avionics or autopilots, which can (and will) take the airplane where you don't want it to go and, if you fight them manually, can work harder and harder to fight back *against* you. Check mode selectors, indicators, annunciator lights, pitch attitudes and headings any time you make an avionics input to confirm it is in the mode you meant to command.

**If indications aren't as expected,** disengage the system and try again. One of the most common declarations heard in today's modern cockpit is "What is it doing *now?*" If you ever find yourself thinking that, shut off the autopilot until you're back in control.

**Any time the airplane makes an unexpected climb or turn** your first response should be to immediately disengage the autopilot. Hit the autopilot disconnect "red button" or its equivalent, manually resume control, retrim as needed and then as time permits troubleshoot the problem.

**Study and practice** every possible way to disengage your autopilot, including back-ups like panel trim switches and servo power circuit breakers. Be able to find the breakers and switches from the pilot's seat with your eyes closed.

See [http://ntsb.gov/ntsb/brief2.asp?ev\\_id=20070613X00718&ntsbno=CHI07MA160&akey=1](http://ntsb.gov/ntsb/brief2.asp?ev_id=20070613X00718&ntsbno=CHI07MA160&akey=1)

Questions? Comments? Email me at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net)

### Coming MFT presentations

- **Sun-N-Fun:** "I Would Never Do *That*", Wednesday, April 22 at 1 pm, forum tent #9.
- **Beechcraft Pilot Proficiency Program Columbus, OH:** "What Really Happens in IMC", Friday, May 15 at 4 pm. Contact [www.bppp.org](http://www.bppp.org) to enroll.
- **Sporty's Pilot Shop Fly-In, Batavia, OH:** "The First 60 Seconds: Takeoff, Climb, Go-Around, Missed Approach and Emergencies." Saturday, May 16 at 1:30 pm.

See

[www.sun-n-fun.org](http://www.sun-n-fun.org)

[www.sportys.com/flyin](http://www.sportys.com/flyin)

## QUESTIONS OF THE WEEK

To get to know readers better, and therefore provide you a better *FLYING LESSONS* product, we're asking short Questions of the Week. Copy the questions below and paste them with your answers into an email to [MFTsurvey@cox.net](mailto:MFTsurvey@cox.net). I'll randomly select an email from those who reply and, once a month, send the selected reader a **Mastery Flight Training hat**. Your email address goes in the drawing once every week you respond in a month's. All responses will remain confidential, but I will publish a breakdown of the results.

Like PIREPs, this works best if *everyone* participates. So take a moment to answer this week's Questions...then come back to read the rest of *FLYING LESSONS*.

### April Question of the Week #2

- Are you instrument rated?
- What is the highest level of pilot certificate you hold?
- Do you plan to add a pilot certificate or rating before your next Flight Review?

Send your response to [MFTsurvey@cox.net](mailto:MFTsurvey@cox.net). Thanks, and good luck!

Question of the Week #1 Response: Almost all who responded own their airplane. Pilots report the primary aircraft they fly as a cross-section of piston types including Beech Sundowners, Bonanzas and Barons; Bellanca Citabrias and Super Vikings; Cessna 150s, 172s, 177RGs, 182s, 206s, 195s and 310s; Cirrus SR20s and SR22s; Luscombes; Mooney Statesmen and Ovations; and Piper Arrows. A number of King Air pilots also responded, both owner-flown and flown for hire. Thanks to all who answered last week's Questions!

## DEBRIEF:

Readers discuss past *FLYING LESSONS* reports

Several readers chimed in about when to retract landing gear, whether upon noting a positive rate of climb or delaying until there is not enough runway left to land. Here's what you said:

When taking off from a long runway, I do not retract the gear until I reach the point where I judge that landing straight ahead on the remaining runway is no longer an option. When taking off from a short runway where I know that a rejected takeoff will result in an off-airport landing, I retract the gear upon attaining positive ROC. (I try to avoid using runways that are this short, but occasionally it is unavoidable.)—Michael D. Busch

I don't believe the notion of waiting for "no available" runway is overly productive in deciding when to retract the landing gear. I pitch up shortly after breaking ground and wait until I see a

positive rate of climb on the VSI [before gear retraction]. On most VSI's, there is a delay of approximately 5 seconds between the time that you actually achieve positive rate of climb and an indication of that rate. Once you retract the gear, your rate of climb increases, thusly giving you more altitude in case of a problem. I have also noticed that it is extremely difficult to actually see when you have run out of available runway with the proper pitch attitude to maintain  $V_y$  during initial climb. In a twin I do basically the same thing, but in addition I will not raise the gear until I achieve  $V_{yse}$  (blue line)—Paul Gretschel

I think it would make the most sense to raise the landing gear on takeoff when you have reached an altitude where, should the need arise, one would have a comfortable amount of time to lower the gear again before touchdown. Simply put, make sure you can put the gear down before you put the plane down.—Clayton Jackson

I retract the gear when I have good airspeed and rate of climb. Should I have a power loss or failure. On a gusty day I am not in a hurry to retract the gear should the plane encounter some unfavorable wind shear and loose some airspeed, don't want to settle back onto the runway with the gear retracted or in transit.—Stan Stewart

I believe we should get rid of the landing gear as soon as it is safe to do so. My personal procedure...is to suck 'em up at ten to twenty feet in the air. If performance is at all marginal, I want five knots above lift off speed before I do so. Waiting until you could no longer land on the runway available is one of those make work techniques that has very little actual benefit. Retracting the landing gear should be a performance related function. We need to be going fast enough and be high enough such that any increase in drag due to the gear retraction process will not cause us to sink back onto the ground. After such a point is reached, the gear is just an undesirable distraction. Get 'em up.—Bob Siegfried

For me it is when there is no more useable runway remaining.—Gregg E. Goodall

The philosophy I use and teach is that the gear should stay down until the gear is no longer needed for a safe emergency landing. The decision to retract gear depends on a couple of factors. Most runways I utilize vary in length from 4000 ft to 7000 ft. The longer the runway, the longer I wait to retract my gear. Another factor is: What is the terrain like beyond the departure end of each runway? Why retract the gear if there is a suitable landing strip off the extended centerline of a runway (such as a road, unused parking lot of suitable size, and in one specific case I know of...a runway of a private landing strip). If operating from an unfamiliar field, I will invariably ask local pilots or flight instructors if they lost power while departing from the currently active runway, where would they consider landing? Most have thought through this scenario thoroughly and are anxious to offer advice. Once the gear is no longer useful for an emergency landing (on- or off-field) or if a decision has been made that any engine failure beyond the departure end would not benefit from a gear down landing (due to the nature of the terrain) the pilot should retract the gear.—Gary D'Antoni

Thanks, readers. As always, you give us plenty to think about!

## From the NTSB

I had the extreme pleasure of hearing Acting NTSB Chairman (and, as I'm proud to say, *FLYING LESSONS* reader) Mark Rosenker address the [Wichita Aero Club](#) on April 14<sup>th</sup>. Chairman Rosenker is a dynamic speaker and instantly likeable; he is high-energy in the way that makes you want to follow his lead. I believe he'd be a demanding master but a fantastic guy to work for if you are very good at your job, and he constantly praises the 400 or so people who work for him at NTSB as being very good at what they do.

Much of the Acting Chairman's talk centered on air carrier mishaps and high-profile events like USAir 1549; the Colgan Air crash at Buffalo, NY and his work on the scene of the recent PC-12 crash at Butte, MT (both of which drove several *FLYING LESSONS*); and leading the NTSB go-team at the site of Steve Fossett's demise.

Laced within his remarks and the NTSB's Most Wanted List for transportation safety improvement were a few items that affect the majority of *FLYING LESSONS* readers who fly single-pilot for recreation or personal and business transportation. Chairman Rosenker said:

While some of [NTSB's] recommendations call for regulations, I firmly believe that regulation is not the only way to improve safety. I believe that voluntary action by industry, in partnership with the government, is one of the most effective ways to decrease accidents.... I have an ulterior motive, an agenda if you will, to reach out as much as I can to enhance safety by speaking at forums like this.

And relevant items (for *FLYING LESSONS* readers) from the [NTSB's Most Wanted](#) List for aviation include:

- Reduce Dangers to Aircraft Flying in Icing Conditions
- Reduce Accidents and Incidents Caused by Human Fatigue
- Improve Runway Safety

Don't ever pass on the chance to hear Mark Rosenker speak about his passion for aviation and all transportation safety.

See:

[www.wichitaeroclub.org](http://www.wichitaeroclub.org)

[www.nts.gov](http://www.nts.gov)

[www.nts.gov/Recs/mostwanted/aviation\\_issues.htm](http://www.nts.gov/Recs/mostwanted/aviation_issues.htm)

Read a transcript of Acting Chairman Rosenker's presentation at [www.nts.gov/speeches/rosenker/mvr090414.html](http://www.nts.gov/speeches/rosenker/mvr090414.html).

Questions? Comments? Send your insights to [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net)

***Fly safe, and have fun!***

Thomas P. Turner, M.S. Aviation Safety, MCFI  
2008 FAA Central Region CFI of the Year



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