



The

Safety

Wire

November 2013

“TAKE ‘ER AROUND THE PATTERN A FEW TIMES,

then park back on the ramp.” It was the words that every student pilot anxiously waits to hear: time to fly solo for the first time. I remember more details about that flight than I do about the flight I took yesterday afternoon. The wind through the trees along the south side of the runway, the blade slap turning downwind to base... After I'd made the circuit for about a half hour, I hover taxied back to the school's ramp and shut down. The hangar seemed very quiet and dark and I wondered where everyone was. After wondering around for a while, I realized that my flight instructor and all of the school's staff had gone home already! I had to hunt down a pilot on the ramp to take my picture to commemorate the occasion. I was not an instructor at the time, but it seemed odd to me that nobody was paying attention during my first solo flight in their aircraft. Most CFIs would agree that sending off a pilot for their first solo and then going home before they get back is not a great plan.



Part of the problem was that it wasn't technically my first solo. I'd soloed in airplanes more than a decade earlier and the rotorcraft certificate I was training for was considered an 'add on'. The school was not used to dealing with 'add ons' and they assumed quite a bit about my experience and knowledge based on that. They were wrong. Worse yet, I didn't realize they were so wrong. As the years went by and I started working professionally, I realized how much information I'd missed out on because I was not considered a new student. Some of that information was critical and it was horrifying to think of how long I'd flown without knowing that stuff.

One of these items was the real effect of cyclic control when entering an autorotation. Following the report on the Air Methods HEMS accident (NTSB: CEN11FA599), it has become apparent that other pilots may have missed out on this lesson as well. I recently

had a discussion with Pete Gillies, Chief Pilot at Western Helicopters, about this topic. Pete is very passionate about this important topic and agreed to let me reprint some of his comments below.



In law enforcement, we often find ourselves in similar situations to the one I was in during my helicopter training. We bring new pilots into our agencies that have experience in different categories of aircraft, different makes and models or other industries such as military, HEMS, or the airlines. It is often tempting to assume that their experience removes the requirement to go through a complete training program. While some

of the information may be review for these new pilots, there is no way of knowing which topics would be familiar and which are new, or even in need of being refreshed a bit. Just as each category of aircraft is unique, our industry requires a unique set of skills and knowledge that simply cannot be obtained in any other field of flying. Flying for a \$100 hamburger in a Cessna 182 and doing tactical flying at night with a thermal camera are two different skill sets despite the similar airframe. Assume nothing; review it all. In reality, does it really hurt any of us to go over the basics? As a closing thought, consider the following data from the NTSB and IHST. They each show the average number of hours for a pilot involved in an accident. The average total time is relatively high, while the make and model time is quite low. For safety's sake, we need to appreciate prior experience, but not trust in it too much.

NTSB – Public Use Accident category (2009 GA Accidents Report)

Category	Pilot's Average Total Time	Pilot's Average Make and Model Time
Helicopter	5,500	580
Airplane	3,500	300

IHST – 2011 JHSAT Report:

Average helicopter accident pilot total time: 4000hrs

Accident pilots with less than 500 hours in make and model: 45%

Ability will never catch up with the demand for it.

--Confucius

From Pete Gillies:

Primary training is where the emphasis on Cyclic Back must start. It must be as automatic as putting the collective down when the engine fails or power to the rotor system is lost for any reason (failure of the drive shaft or over-running clutch, etc.). Talk to most flight instructors and they will say, "Oh sure. I teach my students to apply enough aft cyclic to return the attitude of the airframe to what it was before the throttle was chopped."

This doesn't do a thing for the thousands and thousands of working helicopter pilots who either never had this emphasized during their primary training (and I'm in that group), or have never heard about or read about how critical it is to apply aft cyclic first or simultaneously with lowering the collective. ONLY applying aft cyclic and bottoming the collective IN TIME will catch the falling rotor RPM and keep it above the critical point of no return.

The two accidents I mentioned happened to law enforcement agencies. Neither were training accidents. Both ships had come out of maintenance the day they crashed. One was on a test flight with the duty pilot and the mechanic who had done the 100-hr inspection. The other had done a test flight and had been released for patrol. The regular crew was on board and heading out on patrol.

Both ships suffered engine failures on climb out from the airport at about 400 ft. AGL. Everyone heard a loud boom when the engines quit. Both pilots bottomed the collective immediately and applied forward cyclic to gain or maintain airspeed. Both rotor systems had all but stopped turning when the ships hit the ground. And both ships turned left on the way down because of retreating blade stall! There is NO recovery from this mode of flight.

Luckily, both crews survived. This was because the engine failures occurred at a relatively low height AGL and both airframes are known for their crashworthiness. Both ships burned. The story goes on and on. It was those two crashes, four months apart, which led me to see what was happening. Engine failures cause an emergency. What happens afterwards determines the extent of the damage, if any. This is where pilot training comes into the picture, of course.



Pete Gillies

Chief Pilot - Western Helicopters

SAFETY ROUNDTABLE REVIEW

Recently, at both the Canadian and Central Regional Safety Seminars, I was fortunate to spend some very productive time with ALEA members discussing current safety issues. The Safety Officer Roundtable sessions have been successful in allowing members to sit together and discuss both industry-wide and local safety issues in operations, SMS implementation, and training. In Canada alone, over 30 people attended the forum.

A few of the issues discussed included:

- TFO selection and training
- Pilot training – progressive program (days, then nights, then special ops) vs. all-or-none pilot sign-offs.
- Search techniques and tips (including water searches and marijuana eradication tips)
- ATC coordination
- SMS return on investment tips and techniques
- The iSafety app for Eurocopter aircrews (yes, it's free!)
- The role of the TFO in emergencies and overall impact on safety
- The risk management process (using sample forms available from ALEA)

These are just a sampling of the discussions had during the roundtable sessions. Please join me for a forum in your area. In the meantime, feel free to join the ALEA Safety Officer Mutual Aid Group. Our next online meeting will be on December 10th. Email me for the meeting information (safety@alea.org).



In times of change, learners inherit the earth; while the learned find themselves beautifully equipped to deal with a world that no longer exists.

~Eric Hoffer

SAFETY RESOURCES

IHST Fact Sheets

Over the last year and a half, I have had the pleasure of working with the dedicated safety professionals on the International Helicopter Safety Team. They

continually produce some of the best training and safety materials available. Unfortunately, I often meet aviators who are not familiar with these resources. I used to be one of those pilots. I'd like to pass on a couple of my favorites and invite all of you to take a few minutes to look through the site. There is something for everyone. Even fixed wing pilots can benefit from some of the safety management and human factors documents and tools.

- I use the 2011 “JHSAT Compendium – Volume 1” report so frequently for helicopter safety data, that I made it a document on my computer’s desktop so I don’t have to hunt for it all the time.

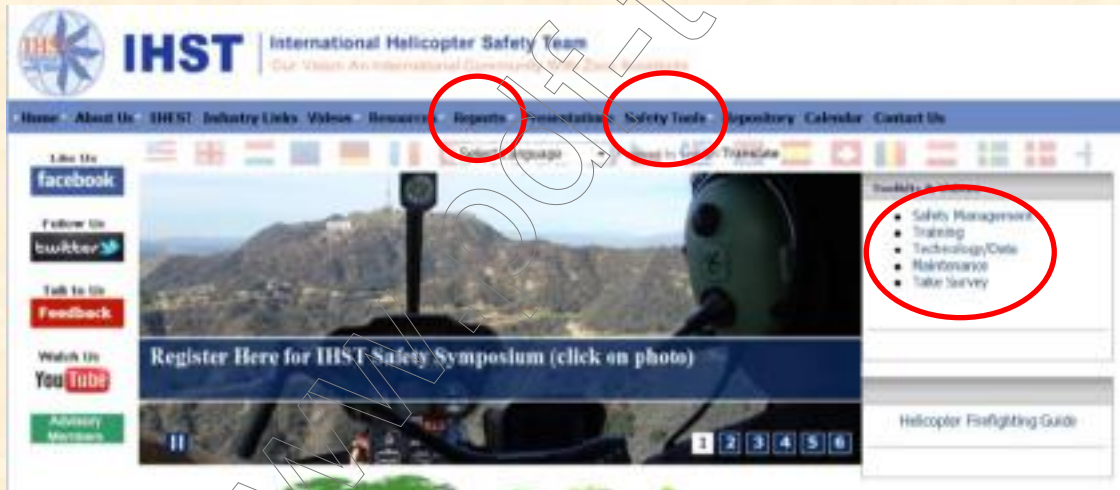
http://www.ihst.org/portals/54/US_JSHAT_Compendium_Report1.pdf

- For pilots and especially instructors, take some time to look through the training fact sheets and bulletins on this page:

<http://www.ihst.org/Default.aspx?tabid=3089&language=en-US>

- Safety officers and SMS managers, check out some of the materials here:

<http://www.ihst.org/Default.aspx?tabid=3053>



AEROMEDICAL SAFETY

Dudley Crosson, PhD, ALEA
Aeromedical Liaison

In a study by the Consortium for Health and Military Performance in the Department of Military and Emergency Medicine, Uniformed Services University of the Health Sciences, Bethesda, Maryland, they found soldiers who ate breakfast regularly (6 times/week or more), drank 7 servings or more



of water/day, and met weekly exercise recommendations, were more likely to be in the highest fitness levels than those who did not. Those who passed their Army Physical Fitness Test (APFT) in the top quartile were also more likely to report higher academic testing scores than those who failed. Soldiers with healthy anthropometric measures (measurements of the human body such as Body Mass Index (BMI), etc.) and the highest emotional, social, family, and spiritual fitness scores were also more likely to be in the top academic quartile than those with unhealthy measures and with the lowest fitness scores.

So, listen to your mothers....eat breakfast, exercise and drink lots of water.

Dudley Crosson
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REALITY CHECK...

ATSB Identification: **AO-2011-115**

Aircraft: Cessna 210

Injuries: None

Full report available: <http://www.atsb.gov.au/media/4216840/ao-2011-115-final.pdf>

The pilot of a Cessna 210N aircraft was conducting low-level aerial survey operations. After encountering a brief turbulence event, the pilot had difficulty in making elevator control inputs and in maintaining height. The aircraft subsequently landed safely. There were no injuries.

What the ATSB found

The ATSB found that the reported elevator control input difficulties resulted directly from the fracture of the aircraft's two horizontal stabilizer rear attachment brackets. The forward spar of the horizontal stabilizer was also extensively cracked. The fractures and cracking were all consistent with metal fatigue and, as such, were typical of the damage sustained by aircraft as they age and move beyond the manufacturer's originally intended design life. Many manufacturers have addressed the growing potential for this type of damage by introducing supplemental inspections to the principal aircraft maintenance requirements.



ATSB Identification: **AO-2012-021**

Aircraft: R44

Injuries: 2 Fatal

Full report available: http://www.atsb.gov.au/media/4122237/ao-2012-021_final.pdf

A Robinson R44 helicopter lifted off for aerial photography of the launching of a deep sea submarine in nearby Jervis Bay. On board the helicopter were the pilot and a camera operator. Soon after lifting off, the pilot's door opened and the pilot reached out to close the door. Simultaneously the helicopter abruptly pitched nose-up, then steeply nose-down, rolling to the right before the right landing gear skid and main rotor blades struck the ground. A fuel-fed fire started in the vicinity of the fuel tanks and lower mast area prior to the helicopter coming to a stop. Both occupants were fatally injured and the helicopter was destroyed.

What the ATSB found

The Australian Transport Safety Bureau (ATSB) found that the pilot's door was not properly latched prior to lift off and opened during the turn to depart. In attempting to shut the door, the pilot probably let go of the cyclic control from the normal (right) control hand, allowing for an unintended, abrupt nose-up pitch and the helicopter tail hitting the ground. The helicopter nosed over and impacted the ground. A fire began when one of the fuel tanks was breached.

The ATSB identified that the fatal injuries were due to the post-impact fire, as was the case in a number of other R44 accidents. A number of these R44s, including VH-COK, had not and were not yet required to have been modified in accordance with a manufacturer service bulletin that specified replacement of aluminum fuel tanks with more impact-resistant bladder-type fuel tanks. The installation of these tanks decreased the risk of a post-accident fire.

Safety message

This accident highlights the importance of ensuring all doors are secured prior to takeoff. That said, the opening of a door in flight will not normally affect the operation of an R44, but the instinctive reaction to immediately deal with such an event can be quite strong. Pilots need to be aware that this reaction may be hard to overcome and in the event of an unexpected situation occurring, such as the opening of the door, it is vital that pilots should continue to 'fly the aircraft'. This includes choosing to land to close the door if necessary. The fitment of bladder-type fuel tanks to R44 helicopters is a worthwhile safety enhancement that could save lives and advice from CASA is that their installation be in accordance with the manufacturer's service bulletin by 30 April 2013 is mandatory.

ATSB Identification: **AO-2011-102**

Aircraft: AS355F2 (Twin Squirrel)

Injuries: 3 Fatal

Full report available: http://www.atsb.gov.au/media/4366706/ao-2011-102_final_1_.pdf

An Aérospatiale AS355F2 (Twin Squirrel) helicopter was being operated under the visual flight rules (VFR). At about 1900 Central Standard Time, the pilot departed an island with two film crew on board for a 30-minute flight to a station for a planned overnight stay. It was after last light and, although there was no low cloud or rain, it was a dark night.

The helicopter levelled at 1,500 ft. above mean sea level, and shortly after entered a gentle right turn and then began descending. The turn tightened and the descent rate increased until, 38 seconds after the descent began, the helicopter impacted terrain at high speed with a bank angle of about 90°. The pilot and the two passengers were fatally injured, and the helicopter was destroyed.

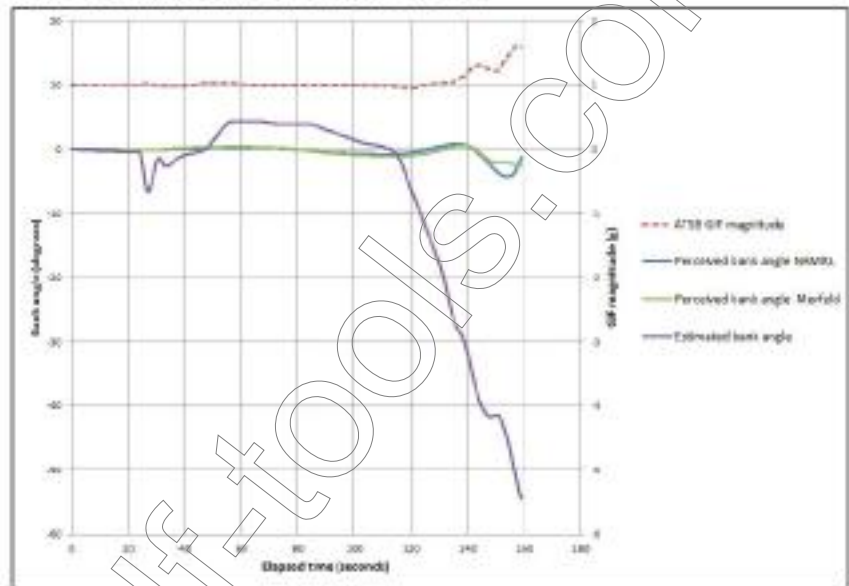
What the ATSB found

The ATSB found that the pilot probably selected an incorrect destination on one or both of the helicopter's global positioning system (GPS) units prior to departure. The ATSB concluded that,

after initiating the right turn at 1,500 ft., the pilot probably became spatially disoriented. Factors contributing to the disorientation included dark night conditions, high pilot workload associated with establishing the helicopter in cruise flight and probably attempting to correct the fly-to point in a GPS unit, the pilot's limited recent night flying and instrument flying experience, and the helicopter not being equipped with an autopilot.

Although some of the operator's risk controls for the conduct of night VFR were in excess of the regulatory requirements, **the operator did not effectively manage the risk associated with operations in dark night conditions.** The ATSB also identified safety issues with the existing regulatory requirements in that flights for some types of operations were permitted under the VFR in dark night conditions that are effectively the same as instrument meteorological conditions, but without the same level of safety assurance that is provided by the requirements for flight under the instrument flight rules (IFR).

Figure 20: Estimated bank angle and perceived roll



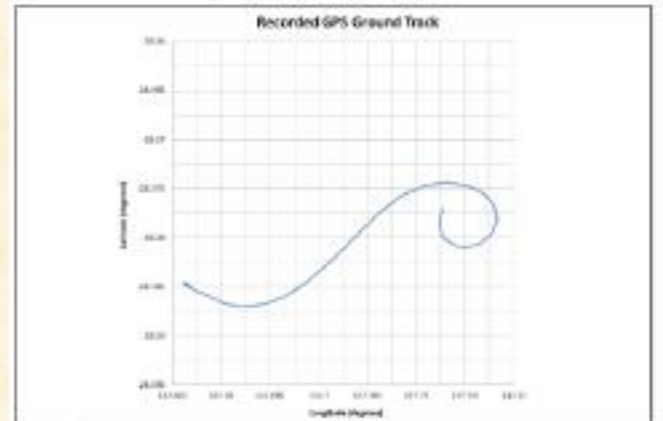
Source: ATSB

[NOTE: Perceived bank angle vs. actual bank angle]

Safety message

The ATSB advises all operators and pilots considering night flights under the VFR to systematically assess the potential for the flight to encounter dark night conditions by reviewing weather conditions, celestial illumination and available terrain lighting. If there is a likelihood of dark night conditions, the flight should be conducted as an IFR operation, or conducted by a pilot who has an IFR-equivalent level of instrument flying proficiency and in an aircraft that is equipped to a standard similar to that required under the IFR.

Figure A10: Recorded GPS ground track



Source: ATSB



As always...

If you would like to be a part of this process, please contact me.

If you have a story to tell or a lesson to pass on, send it to me.

If you like what you see happening with the program, I would like to hear from you.

If you want to see something different, or additional... I NEED to hear from you!

Until the next flight,

Bryan 'MaGi' Smith

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<http://www.pdff-tools.com>