AIRBORNE LAW ENFORCEMENT ASSOCIATION

The Safety Wire

October 2013

"BECAUSE I SAID SO." I could tell by the look of bewilderment in my three year old son's eyes that I had not conveyed a clear understanding of why one should not color the toy box with a black permanent marker. He understood *what* the rule was, but not *why* it was important. Unless I crossed that threshold of comprehension, I was likely to obtain compliance with the coloring policy only when there wasn't an immediate threat of getting caught. If I didn't want to repaint the toy box, "Because I said so," was simply not going to cut it.

Any safety policy or procedure we have should serve a purpose that can be easily articulated. Sometimes it is easy to get wrapped up in the system that creates or monitors policy and, over time, we forget why we are doing it. We catch ourselves explaining the way we do things with comments like, "That's the way we do it here," "It's how we've always done it," or "That's just the safe way to do it." We need to be able to explain *why* we have that policy, otherwise it is just a variation of the, "because I said so" reasoning…ensuring the policy is doomed to failure.

One of the most powerful means of showing why we have safety policies and procedures is through real world examples. This month, I want to make space for two stories sent to me by ALEA members. Both are included here with their permission.

Aviation Safety Officer Workshops

Vancouver
Tuesday, October 29th

Dallas
Tuesday, November 5th

At all upcoming ALEA Regional Safety Seminars, there will be an Aviation Safety Officer's Forum. The format is an open workshop and roundtable discussion. The content will be determined by the input of those attending. We will work with sample forms and tools used within an SMS to manage safety. The group will also be able to exchange ideas and seek solutions to safety challenges facing their operations.

> Anyone who conducts an argument by appealing to authority is not using his intelligence; he is just using his memory."
>
> **--Leonardo da Vinci,**

Recently, ALEA Training Program Manager Don Roby and I discussed the need to develop some educational programs in 2014 directed at improving coordination of aviation assets within an incident command system. We have seen a number of international newsworthy incidents lately where multiple agencies and various aircraft are thrown together in high-stakes scenarios. The first story is from Sgt. Brian Paul of the Ontario Provincial Police (Thanks to ALEA Canadian Safety Liaison Ted Smith for passing on the information). I think Sgt. Paul's story shows the risks involved in a large operation such as this and he offers a great example of the complexity involved in doing it right:

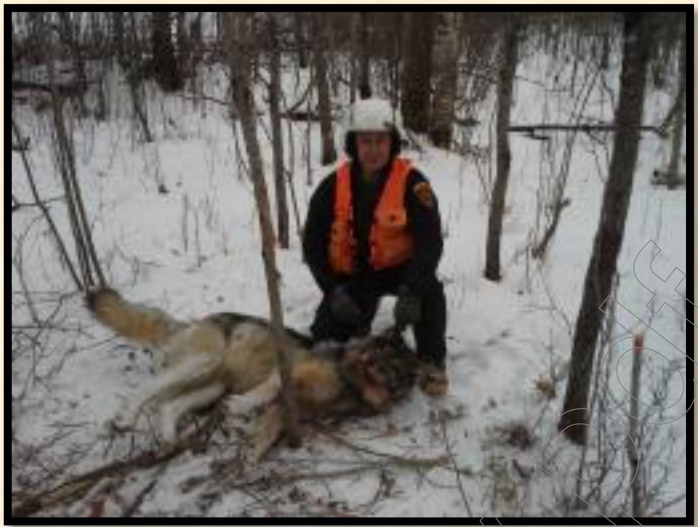
I was one of the pilots involved in the search for the two missing teenage girls at Bon Echo Provincial Park and I thought I would pass on one important safety lesson regarding this search. We don't often have multiple aircraft during our searches. Occasionally, both of our EC135s might be at a search together, but it's rare. Also, JRCC (Joint Rescue Co-Ordination Centre), which are our Canadian Military SAR folks, occasionally are tasked to the same search we are working. This particular search saw both of our OPP helicopters and a military Bell 412 utilized in helping to locate the girls. The first day of the search, ours was the only aircraft. But, as the second day wore on, it appeared that the search could become an extended operation and I requested our second 135 attend to provide a night search using FLIR and NVG. The military 412 also was requested, so by 1700 hrs. on the second day, three helicopters were tasked to this operation. As you know, when you get multiple aircraft flying in a relatively small area of airspace, things can get interesting. The crews spend more time searching for the other aircraft then looking for your missing person(s). For this reason, we had all three aircraft land at the park and did a full debrief to the new crews that had arrived (2nd OPP helicopter and the 412). Once the newly arrived aircrews were briefed on the search particulars, I divided the airspace into three sections (one for each aircraft). We did north, south and west search areas with the lake and campground as the common reference point. This way, everyone knew where they were searching and where their boundaries were. Both of our 135s have TCAS systems and that is hugely beneficial, especially during times such as these. I recommend all search aircraft be fitted with these systems. The plan was that after the first fuel stops, the search aircraft would rotate and then search a different sector, the reasoning being to put fresh eyes over a new area. Fortunately, we located the girls before this occurred.

So, in a nutshell, multiple aircraft in the same search area need to take the time to land and do a good briefing with all aircrews involved. Have definite search boundaries for each aircraft and if fixed-wing aircraft are involved, then altitude must be agreed upon and maintained. Any deviation from the established altitudes or airspace must be clearly broadcast to the other search aircraft and acknowledged by the same. Agree upon a common frequency to use and have a backup one just in case.

I have said many times that the quality of this program depends heavily on the participation of the membership. I would like to thank Sgt. Paul for his input and also pilot Brad Maas of the Minnesota (my home state) Department of Natural Resources (DNR), Division of Enforcement for the following story. Brad sent me a summary of an engine failure he experienced while returning from a mission.

Though Brad is very modest about his role in the successful outcome (as all good Minnesotans are!), I think it is a great example of how training and professionalism paid-off at a critical moment. During a phone interview, Brad said that he credits his agency's commitment to training. The Minnesota DNR has a pilot currency program that is actually approved by the local FAA FSDO office. Part of the program is having an outside contractor fly with their pilots once a year, which is a practice I highly recommend for many reasons.

He agreed to share his story with the rest of the membership in the hope that it will benefit someone down the road. This is another reason why it is so critical I get information from you all out in the field. This 'incident' will not show up on any NTSB reports because Brad did a phenomenal job. If he did not write to me about it, none of us would have the opportunity to benefit from the story.



I had completed 3 days of finding wolf packs with radio-collared wolves. It involves a lot of hovering right above the treetops to get them to come out in the open in order to get a good count. I was flying our Enstrom F480B. I had dropped off my research biologist at his home airport and was headed back to our home base, which was about 60 miles away. Recently, it had been very cold, but that night, it had warmed to about 5 degrees Fahrenheit. It was a beautiful evening and everything was working fine. It was about 25 minutes after sunset and I had about 18 minutes to home, when all of a sudden, the nose pitched up with a simultaneous 'BANG,' followed immediately by a 70 degree left yaw and approximately 40 degree nose-down attitude. As I yawed left, I saw a large puff of smoke out of the left side of the aircraft. I lowered the collective, continued the left turn, and started looking for a landing spot. There was an east –west road I thought I could make it to. North of me was nothing but woods, and south of me was swamp and woods. While in the left turn, I remembered to check the throttle, it was full open, and I heard the engine making noises like it wanted to operate. I had no luck in getting power back from the engine and as I turned to line up with the road I heard the engine spool down to zero. I was pretty sure I could make the road, but I had low rotor rpm. I did the best deceleration I could, and did the old "initial, level, and cushion." I held it off the ground as long as I could, leveled it, and dropped about 2' to the pavement, sliding about 90' to a stop. I had completed a 300 degree turn from 700' AGL to a quiet county road at dusk.

There were two separate witnesses that watched me fly by, saw and heard the bang, puff of smoke, and me laying on my side [in a tight turn]. They thought I was going into the trees. I'm going with Divine Intervention on this one, as it could have happened anywhere else, but it didn't. I'm grateful I was able to make the landing I did.

I have to say, it was an automatic response to the engine failure. I practiced a lot of simulated engine failures, as a student in different airframes and as an instructor. We practice them each year in our check rides for the aviation section (we terminate at a hover). I was amazed how fast it happened, all in about 10-12 seconds…

The NTSB has called it an “incident,” as I didn’t do any damage to the main rotor blades or tail rotor blades. There was only some minor damage to the right rear crosstube brace. Enstrom and Rolls Royce removed the engine and did an extensive set of tests. I’d landed with 330lbs of fuel and normal oil levels. After all of the tests and head-scratching, we found nothing that indicated why the engine failed.

An Incident Review Board was assembled, which included agency members, the Chief Pilot and myself, and an outside aviation safety expert. Overall, the board went well….they were very impressed with our safety and training program, and grateful that the Chief Pilot went beyond the minimum legal requirements following an incident like this to try and find answers. They thanked me for my years of service and experience level, said that they were grateful I was on the controls, and it had a happy ending.

Will I probably fly a little higher from now on, especially flying after sunset? I’m thinking yes… I should try to improve my safety margin…

More than anything else the sensation is one of perfect peace mingled with an excitement that strains every nerve to the utmost, if you can conceive of such a combination.

~Wilbur Wright

Safety Resources

Are you a new manager or administrator in the public safety aviation world?

Are you a safety officer who needs to get the boss some information managing safety in a public safety aviation unit?

I have worked with a number of ALEA unit managers and safety officers to develop a simple brochure containing important safety information that every manager in public safety aviation should know.

The brochure is available for download from the ALEA website here:
http://www.alea.org/assets/cms/files/safety/Brochure%20Management%20Leadership.pdf

SMS Development

- ✓ Establish the Context (Policy)
- ✓ Identify the Hazard
- ✓ Analyze the Hazard
- ✓ Determine the Risk (Risk Assessment)
- **5. Treat the Risks**
- **6. Monitor and Review**

Our Risk Management process has led us through the establishment of the program, identification of hazards and contributing components, the analysis of risk associated with those hazards, and finally, the role of a safety committee in determining what course to take (see previous safety newsletters for this info). Now we are ready to begin treating the risks. We treat risk with training, policies, procedures, equipment purchases, etc. In the spirit of this newsletter, I'd like to concentrate this month on how we can focus these risk controls so they do not fall into the, "Do it *just because* it's the rule" trap.

When evaluating each hazard, we used the Likelihood vs. Severity chart to determine the risk. When we develop a risk mitigation, target either the likelihood or severity element of the hazard. This will work better than just trying to think of the hazard itself.

Example #1: Hazard – Increased bird strike incidents

- Risk Control Option – Equipment changes. If the hypothetical operation in this example was not wearing helmets, an option would be to purchase and require the use of helmets and eye protection. This risk control targets the potential severity of the hazard.

Example #2: Hazard – Tools found left in engine compartment

- Risk Control Option – Tool Control System. Utilizing a tool control system would increase accountability of any tools used during maintenance. This is obviously aimed at lowering the likelihood of the hazard causing an incident.

Example #3: Hazard - Inadvertent Flight into Instrument Meteorological Conditions (IIMC)

- Risk Control Option #1: Purchase improved weather monitoring software or onboard equipment. The goal of this type of risk control would be to lower the likelihood of the hazard by increasing the chances of a flight crew identifying and avoiding flight into instrument conditions. Another means of lowering the likelihood of this hazard would be through the inclusion of an en route decision point policy or IIMC avoidance training.

- Risk Control Option #2: Training both the pilot and TFO in IIMC emergency procedures. Training the flight crew on how to prepare for and react to an IIMC encounter would be aimed at lowering (but unfortunately not eliminating) the severity of this hazard.

If we were to simply target the above hazards without considering the individual risk components, we might be inclined to respond with something like, "Keep a look out for birds and try not to hit one," "Don't fly into IMC conditions," or "Try and keep track of your tools better." Obviously we want to find more effective solutions.

None of the risk controls mentioned above would eliminate the hazards. However, they would be able to lower (or control) the risk associated with them. Additionally, if someone asked, "Why do we do this?" we would have an answer other than, "Just because…"

When we come to the last step of the risk management process (RM Assurance), we will see how targeting likelihood and/or severity can make tracking the performance of the risk control easy and effective.

The following ALEA SMS tools have been **updated** this month. They are now easier to fill in on the computer. Several definitions and directions have been updated for clarification and ease in completing the process.

Reporting Forms (Word): *http://www.alea.org/assets/cms/files/safety/Aviation%20Section%20Safety%20Program%20Reports%202.0.docx*

SMS form (Excel) - blank: http://www.alea.org/assets/cms/files/safety/SMS%20Book%201%20blank%202.0.xlsx

SMS form (Excel) - with examples: *http://www.alea.org/assets/cms/files/safety/SMS%20Book%201%20with%20examples%202.0.xlsx*

One cool judgment is worth a dozen hasty councils. The thing to do is to supply light and not heat."

-- Woodrow Wilson,
28th U.S. President

Aeromedical Safety

Dudley Crosson, PhD, ALEA Aeromedical Liaison

We have all been told about the issues related to flying and alcohol. I just thought you might be interested in a little more detail. I have reviewed a number of studies and would like to summarize them for you.

One study by CE Billings showed that in-flight evaluations of pilots with BAC of 0%, 0.04%, 0.08% and 0.12% have suggested that even quite low blood concentrations of alcohol cause significant performance decrements in flight. This study concluded that "blood alcohol concentrations of 0.04% are associated with substantial and highly significant increases in the number and potentially seriousness of procedural errors committed by both inexperienced and highly experienced pilots." Other studies by Billings, EG Aksnes, PH Henry, AF Stokes, and D Morrow showed performance using aircraft flight simulators supports the relationship between the blood alcohol level and the number of aviation procedural errors.

A study by JM Levine showed performance impairments due to the ingestion of alcohol depend, in part, on the blood alcohol levels produced and on the ability requirements of the task. This observation has been supported by studies on the effects of alcohol on the performance of aviation related tasks. These tasks have been shown to be impaired by blood alcohol concentrations of 0.025%, 0.04%, 0.08% and 0.15%.

The point to this is that it obviously does not take much to impair performance. Depending on your physiology, alcohol levels may not reduce as quickly as we would like. Please, just be careful.

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Reality Check...

NTSB Identification: **ERA13LA421**
Aircraft: AS350 B2
Injuries: 4 Minor

On September 19, 2013, about 2127 central daylight time, a Eurocopter AS350 B2 emergency medical service (EMS) configured helicopter experienced a hard landing in a field following a total loss of engine power. The airline transport pilot, two crew members, and a passenger incurred minor injuries.

According to the pilot, about 10 minutes after departure, a low engine oil pressure indicator warning light illuminated. He noted that there was no rise in the oil temperature indication or engine temperature indication and continued toward the intended destination while attempting to verify the loss of engine oil pressure. Several minutes later the pilot noticed a low torque reading and again noted that there was no rise in the oil temperature or engine temperature. About 25 minutes after departure, the pilot saw a rise in the engine temperature gauge and lowered the collective. He then observed the engine temperature rising at a higher rate and located an open field in order to perform an off airport landing. The engine lost total power prior to reaching the open field and the pilot performed an autorotation. After impacting the ground, the pilot performed the emergency shutdown procedures.

The helicopter came to rest in an open field that was surrounded by trees. It remained in an upright position and the landing gear crosstubes were bowed. The tailboom separated from the helicopter and came to rest just aft of the fuselage. The main rotor blades remained intact and attached to the rotorhead.

NTSB Identification: **WPR13LA035**
Aircraft: CESSNA 172M
Injuries: 2 Minor

During a photography mission, the pilot applied full engine power, and the engine speed dropped to idle. After attempting a series of troubleshooting steps, the engine did not respond, and the pilot performed a forced landing into a field. The airplane landed hard and nosed over. Postaccident examination of the engine revealed that the outer jacket of the throttle control cable had fragmented at the carburetor attach point, exposing the inner cable. Subsequent throttle control movement resulted in the cable flexing out of the jacket, rather than moving the throttle control arm at the carburetor. No life limit existed for the cable, which was most likely installed at the time of airframe manufacture, 38 years prior to the accident. Further examination of the engine revealed no additional evidence of a mechanical malfunction or failure that would have precluded normal operation.

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Failure of the throttle control cable during maneuvering flight, which resulted in a partial loss of engine power.

Transportation Safety Board of Canada (TSB)
Aviation Investigation Report: A11Q0168
Aircraft: Robinson R44
Injuries: 4 Fatal

Around 2050, the pilot and 3 passengers returned to the helicopter for the night flight home. The aircraft did not appear on the radar after take-off. No one saw the aircraft take off or crash. Only a sound of impact was heard, around 2100. At 2109, a distress signal from the aircraft's emergency locator transmitter (ELT) was detected by the Cospas-Sarsat satellite system. At 2344, the aircraft was found by a Sûreté du Québec officer in a wooded area about 3940 feet northeast of the take-off point, just 1215 feet from the far end of Runway 05.

The pilot held a private pilot license (helicopter) since 2005 with a valid Category 3 medical certificate. The pilot had trained on an R44, and in December 2006, received a night rating. The pilot's logbook showed, as of 26 August 2011, a total of 879.7 hours of flight time on helicopters, including 10.6 hours of simulated instrument time. As of that date, the pilot had also logged night-flight time of 13 hours dual and 46.8 hours solo. In the last 6 months, the pilot had logged 6 hours of night-flight time as pilot in command, for a total of 9 take-offs/landings, which satisfied the recency requirements stipulated in the *Canadian Aviation Regulations* (CARs). All of these take-offs took place in areas where the surrounding environment was illuminated.

The aircraft was equipped with a Kannad 406 AF model ELT transmitting on 121.5 megahertz (MHz) and 406 MHz. The ELT activated on impact, and was not damaged in the accident. It remained in its bracket, and its antenna remained attached. In this occurrence, none of the GEOs [SARSAT satellites] detected the signal. However, the LEO [satellite] captured the coded message on the 406-MHz frequency at 2109, and the calculated position was relayed to the Joint Rescue Coordination Centre (JRCC), which is responsible for coordinating all search-and-rescue (SAR) operations associated with aircraft and marine emergencies. The Sûreté du Québec was informed of the calculated position of the crash at 2241 (NOTE from Bryan: this took 1.5 hours. Please have your own Emergency Response Plan in place)

Findings

Findings as to causes and contributing factors

1. The pilot had few outside visual references during the night flight.
2. The pilot probably lost control of the aircraft shortly after take-off due to spatial disorientation.

Findings as to risk

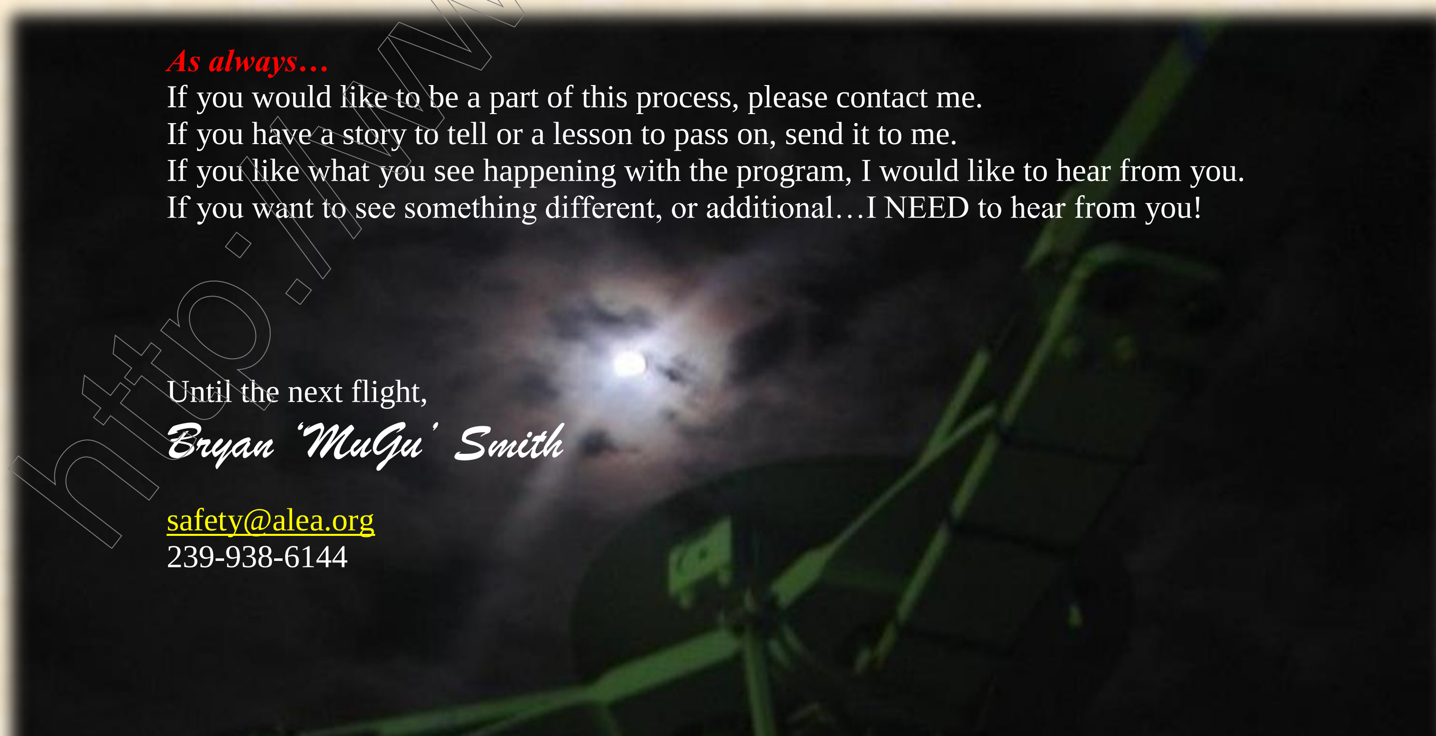
1. Take-off at night from an unlit aerodrome increases the risk of collision with obstacles or the ground.
2. Pilots without extensive night flight experience outside well-lit areas are at higher risk for spatial disorientation.
3. When information in the Canadian Beacon Registry is not updated following a change in owner or registration, additional efforts are required to find the owner's contact information, which could delay the deployment of search-and-rescue services.
4. It is possible that the minimum requirements to obtain a private helicopter-pilot night rating may not be sufficient to adequately educate and demonstrate to private helicopter pilots the risks involved in night flying, including visual illusions that could lead to spatial disorientation.

(NOTE from Bryan: The full report has loads of additional information and is worth the time to read. The link is: http://www.tsb.gc.ca/eng/rapports-reports/aviation/2011/a11q0168/a11q0168.asp)

A teacher asks a student, "What do you want to be when you grow up?"

"Well, I want to be a pilot when I grow up," replied the student.

"Honey, I'm sorry but you can't do both."



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 'MuGu' Smith

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