AIRBORNE LAW ENFORCEMENT ASSOCIATION

The Safety Wire

January 2014

CLEAR!

The engine has started on a new year of public safety aviation and I, for one, am very excited about it. This is a great time for our industry and those involved in it. We have a steady flow of new equipment on the market that we previously only dreamed of, improving (although not perfect) economic support, new operational ideas and tactics taking hold, and a full year of ALEA events and programs that will deliver more support to our members than ever before. I truly feel that 2014 is going to be a great year.

Before looking ahead though, it is important to take a look back on the previous year. A brief summary of our accidents is listed below. More information is available on the ALEA Law Enforcement Accident Database. Unfortunately, we are still waiting for the investigations to be completed on most of the 2013 incidents, and many of the 2012 incidents as well. The information that I was able to find has been updated on the ALEA website, including accident report numbers (when available). Remember, this information only includes those incidents that were reported officially or to me personally.

		Fatalities/Serious Injuries	
1.	Helicopter	3	Crash in IMC conditions (snow)
2.	Helicopter	5	Wire strike during pursuit in IMC conditions (Venezuela)
3.	Helicopter	1/4	Collision between two aircraft when landing (white out)
4.	Helicopter		Engine failure – investigation pending
5.	Helicopter	2	Agents fell from helicopter during fast rope training
6.	Helicopter	1	Officer fell during hoist
7.	Helicopter		Engine failure – post-maintenance flight (possible FOD intake)
8.	Helicopter		Engine failure – during autorotation training while on climbout

9.	Helicopter		Apparent LTE (? – investigation pending)
10.	Helicopter		Autorotation training
11.	Helicopter		Autorotation training
12.	Helicopter		Autorotation training
13.	Helicopter		Wire strike - in cruise flight (night)
14.	Helicopter		Wire strike - during takeoff from an unimproved LZ (night)
15.	Helicopter	2	Wire strike - while landing (daytime)
16.	Helicopter	3	Crash during NVG training (Peruvian National Police)
17.	Helicopter	3	Unknown – Police Scotland
18.	Airplane	1	Apparent stall/spin while directing units to suspect location (investigation pending)

Totals:

Accidents: 18
Fatalities: 18
Serious Injuries: 7

ALEA Law Enforcement Accident Database:
http://www.alea.org/safety/accidents

The [flying] machine does not isolate man from the great problems of nature but plunges him more deeply into them.

--Antione de Saint-Exupery
Wind, Sand and Stars

Practical

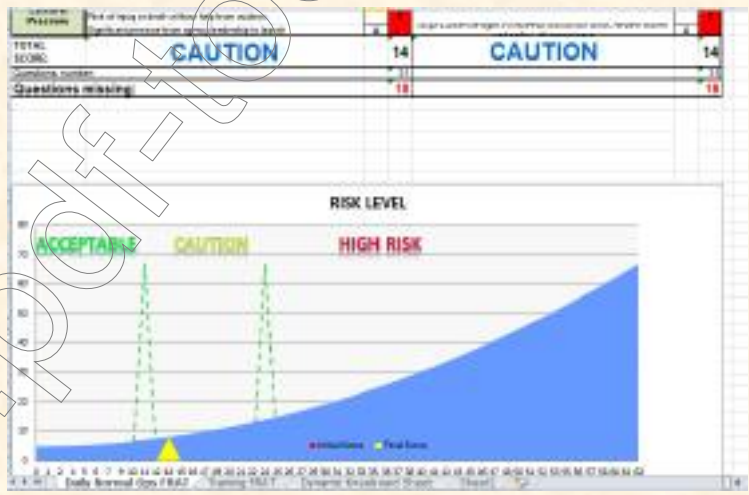
Safety Management System
Implementation

ALEA Flight Risk Assessment Tool (FRAT) download:
http://www.alea.org/assets/cms/files/safety/ALEA%20FRAT.xls

In the November/December 2013 issue of Air Beat, I wrote about the reasons we should all consider using a Flight Risk Assessment

Tool (FRAT). After working with ALEA safety officers and IHST members, I have come up with a sample FRAT for ALEA members to use. It is based on one developed by the European section of the International Helicopter Safety Team (EHEST website: easa.europa.eu/essi/ehest). This FRAT has tools that allow you to remove or add any questions to the document so you can customize it to better fit your operation. If you want to change the scores for any item, you can do so in the formula bar (contact me and I can walk you through this if you are not sure how to do it).

The FRAT contains a 'static' and a 'dynamic' section. The intention is that this is something a flight crew fills out at the beginning of the shift using the known static information and the projected dynamic scores. Just before a mission launches, the crew can review the shorter dynamic section to see if anything has changed. This resolves one major issue that has made most FRATs unsuitable to public safety operations that respond on time-sensitive 'alert' status. The content has been adjusted to reflect the most significant safety issues in a typical law enforcement aviation unit. Again, each agency will need to customize it somewhat.



To the right of each question is a list of mitigation strategies. These are just examples and not meant to be a complete list. If you need to lower a high score on the FRAT, think of a way to mitigate the risk and enter it in the 'mitigation' column with the corresponding score. Each unit will have to decide how to score these options. If the score cannot be brought down into the 'green', the aircrew should be required to call a contact person to discuss the elevated risk flight. This contact person should be an experienced pilot who understands the risks and how to reasonably mitigate them (see Nov/Dec Air Beat for more info).

There is a tool on the FRAT that allows the user to email a copy to the safety officer. For safety officers, the FRAT is a hazard reporting source that you can use in your SMS. Over time, you can use the scores to direct your program so it can make a more significant impact on safety *and* help increase flight activity.

During the Safety Officer Mutual Aid meeting (Feb 10th @ 2000 zulu), we will go over this FRAT and how a safety officer can utilize it. If you are interested in joining, please contact me for the meeting information.

Many people helped work on this project. I would especially like to thank:

Stefano Burigana & the IHST/ESEST SMS team
Bret Rhodenizer – Alachua County Sheriff's Office
Glenn Daley – NYPD (ret.)
Scott Roeder – Tucson Police Dept.
Jeffrey Deal – North Carolina State Highway Patrol
Andrew Edgerton – Fairfax County Police Dept.
Terry Mulkey – Atlanta Police Dept.
Stuart 'Kipp' Lau – International Helicopter Safety Team (USHST)

Don't ever let an airplane take you someplace where your brain hasn't arrived at least a couple of minutes earlier.

~Andy Anderson

Thank you!

I would like to take a moment to thank Steve Ingley for making this safety program successful and for bringing ALEA up to the high standard we all enjoy today. When I first began this role as the safety program manager, I tortured Steve with daily emails and phone calls. He answered every question I had, providing support and guidance for me and the program. Every month, Steve reviews these newsletters for content and the several hundred grammatical mistakes I put in each one to ensure he doesn't get bored. Without a doubt, his dedication to our industry has made a significant impact on our safety. Any success the safety program has enjoyed can be directly linked to Steve's influence and he will be sorely missed.

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, 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.

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Safety Resources

For those of you flying in areas with snow and ice:

http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/(LookupSAIBs)/SW-08-03R4?OpenDocument

http://www.tc.gc.ca/eng/civilaviation/publications/tp185-4-07-winter-operations-4043.htm

Latest NASA newsletter on 'Expectation Bias':

http://asrs.arc.nasa.gov/publications/callback/cb_406.html

Reality Check...

NTSB Identification: **WPR14LA084**
January 01, 2014
Aircraft: EUROCOPTER EC 130 B4
Injuries: 1 Uninjured.

A Eurocopter EC 130 landed hard during an autorotation while on short final. The commercial pilot was the sole person on board and was not injured. The helicopter came to rest on its right side and sustained substantial damage to the fuselage and tail boom.

The pilot reported that she completed the post-maintenance operational check flight and was on short final, about 200 feet above the ground with an airspeed of 40 to 50 knots. Shortly thereafter, the fuel pressure indicator light illuminated and the engine "flamed out". The pilot stated that she lowered the collective to initiate an autorotation, but did not have the airspeed to successfully complete it.

The helicopter's tailboom impacted the ground first during the accident sequence, followed by the hard landing. The helicopter's skids separated and the fuselage sustained substantial damage.

NTSB Identification: **ERA13LA025**
October 12, 2012
Aircraft: PIPER PA-28-140
Injuries: 2 Uninjured.

A Piper PA-28-140 was substantially damaged during a forced landing to a corn field, following a partial loss of engine power during initial climb. The certified flight instructor (CFI) and private pilot were not injured.

The CFI stated that the airplane was fueled to 36 gallons prior to the flight. The engine start-up, taxi, and run-up were normal. While departing from runway 31, about 200 feet above ground level, the CFI noticed that the throttle lever did not appear to be completely forward. He and the private pilot pushed the throttle lever full forward with resistance, which was followed by engine sputtering. The CFI then applied carburetor heat; however, the engine continued to sputter. He then elected to land in a corn field. During the landing, the engine firewall and right aileron were substantially damaged.

Examination of the wreckage by a Federal Aviation Administration (FAA) inspector revealed that the No. 2 top sparkplug, No. 3 bottom sparkplug, and No. 3 top sparkplug were "fouled." During a subsequent test-run of the engine, the engine lost all power whenever the right magneto was selected. Laboratory examination of the right magneto revealed that seven teeth from its drive gear were fractured and exhibited single-sided bending fatigue, consistent with applied force in one direction over a period of time.

The airplane was manufactured in 1972 and equipped with a Lycoming O-320-E3D, 150-horsepower engine. According to maintenance records and an FAA inspector, the airplane's most recent annual inspection was completed on August 22, 2012. The engine's most recent overhaul was completed on June 27, 2005. At the time of the accident, the engine had accumulated approximately 72 hours since the annual inspection and 2,300 hours since overhaul. The FAA inspector further reviewed the maintenance records and noted that the accident magnetos (Unison [Slick] model 4370 right, and model 4371 left) were installed at overhaul and had not been replaced or serviced during the time since overhaul. Additionally, when the inspector

attempted to disassemble the magnetos for examination, he had to remove inspector's lacquer (yellow paint) from screw holes, which was also consistent with the magnetos never having been disassembled for inspection since overhaul. The engine manufacturer recommended overhauling the engine every 2,000 hours or 12 years, which would have included replacing the magnetos with new or overhauled units. Additionally, Slick service bulletin (SB-308A) recommended inspecting the magnetos every 500 hours.

NTSB Identification: **ERA12FA563**
September 15, 2012
Probable Cause Approval Date: 12/02/2013
Aircraft: AEROSPATIALE AS 355F1
Injuries: 1 Fatal

During cruise flight, witnesses on the ground reported hearing a grinding or popping noise, which was followed by the separation of the yellow main rotor blade. Examination of the fore/aft servo revealed that the internal threads of the upper rod end fitting on the servo were severely worn. The lower threaded portion of the upper rod end was not found secured into the servo's upper end fitting and was not recovered. Additionally, the upper end fitting was packed with soil as the lower threaded portion of the upper rod end had separated from it prior to ground impact. A 100-hour maintenance inspection of the accident helicopter had been completed on the morning of the accident and a 600-hour inspection of the accident helicopter was completed about 3 months prior to the accident. Neither inspection detected the worn threads on the fore/aft servo upper end fitting. The fore/aft servo had been overhauled about 4 years prior to the accident. Additionally, the fore/aft servo was repaired 10 months prior to the accident and no anomalies were observed with the threads at that time.

The operator used Mastinox, a corrosion inhibiting compound, during installation of the upper rod ends to the right-roll, left-roll, and fore/aft servos. The helicopter manufacturer's maintenance manual listed only G.355 grease and did not prescribe for the use of Mastinox. However, the standard practices manual stated that a torque correction factor of 0.4 is used for G.355 grease, but not for Mastinox, since the latter is not a lubricant. The torque value listed in the manual for the rod ends already took a torque correction factor into account. A higher torque value would theoretically have been necessary when Mastinox was used in place of G.355 grease. The operator stated an adjusted torque value was not used during installation of the upper rod ends using Mastinox. Evidence of sealant at the junction of the upper rod end and nut, which was required to be applied during servo installation per the maintenance procedures, was not found on either the right-roll or left-roll servos. While the lack of sealant may not result in a catastrophic event, its breakage or absence (and/or radial play of a servo end bearing) noted during a maintenance inspection could be indicative of a loss of torque.

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

Disconnection of the upper rod end from the fore/aft servo due to severely worn threads, which resulted in a loss of control and separation of a main rotor blade during cruise flight. Contributing to the accident were incorrect maintenance procedures and inadequate maintenance inspections performed by the operator, and insufficient inspection criteria provided by the helicopter manufacturer.

NTSB Identification: **WPR12FA091**
February 04, 2012
Aircraft: CESSNA T206H
Injuries: 2 Fatal, 2 Serious

The pilot departed before dawn in the single-engine airplane with three passengers. One passenger reported that after an uneventful departure, the airplane made an unexpected right turn, with no comment from the pilot. A ground witness observed the airplane in an unusual attitude shortly after takeoff. The airplane then flew out of her view, and a few seconds later, she observed an explosion beyond the runway. The debris field and associated ground scars were adjacent and perpendicular to the runway. The airplane damage and debris distribution were consistent with a high-speed, right-wing-low descent into the ground. All sections of the airplane were located at the accident site, and no anomalies were noted with the airframe or engine that would have precluded normal operation. The damage to the propeller and turbocharger was consistent with the engine producing power at the time of impact.

The airport's automated weather observation system was reporting 8-mile visibility, but with low broken cloud ceilings about the time the pilot would have been performing his preflight inspection. A rapid degradation in weather conditions occurred over the 10-minute-period following the accident, including freezing dense fog and low overcast cloud ceilings. The airport was located on the outskirts of a town, and the route of flight following the initial turn was toward a sparsely populated area. The moon was below the horizon at the time of the accident.

The pilot did not possess an instrument rating, which coupled with the lighting and weather conditions, could have made him vulnerable to spatial disorientation. The airplane's impact trajectory was consistent with the pilot experiencing this phenomenon. Additionally, an instrument-rated pilot departed from the same runway shortly after the accident unaware that it had occurred. He reported that before departure, he could see haze beginning to form close to the ground but could still see clear skies in his direction of travel and presumed that visual meteorological conditions existed. However, during the initial climb, he inadvertently entered a fog layer, and became disoriented.

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's encounter with low clouds/low visibility conditions during the initial climb, which resulted in spatial disorientation and loss of airplane control.

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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