

Flight Test Safety Fact



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Safety, Flight Test, and Drones all Over

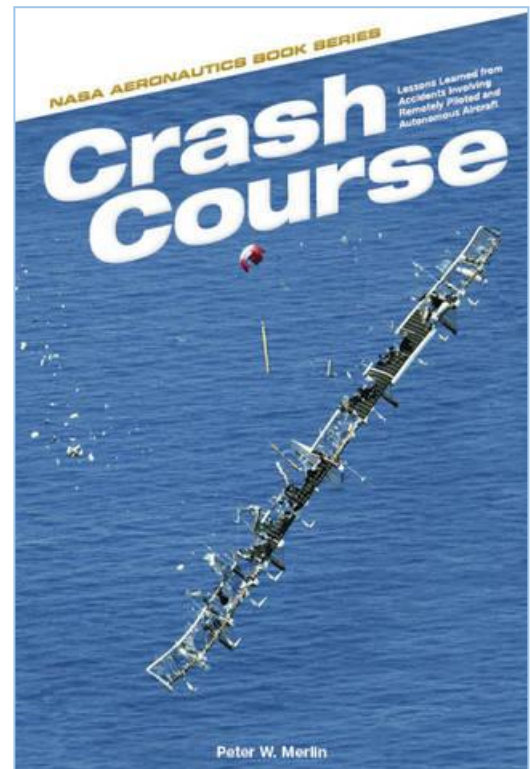
Mark Jones Jr., Editor

On Saturday, November 12, 2022, a B-17 and Bell P-63 Kingcobra collided in mid-air at a Dallas airshow. The accident resulted in the loss of all six people on the two aircraft. The topic of Airshows first appeared in the Flight Test Safety Fact (FTSF) in Issue 19-04, and it generated a lot of discussion and [feedback](#). But the timing of this incident is important for several reasons. First, the late Des Barker (SETP), diligently documented airshow mishaps for several years in the Cockpit magazine and in presentations at various symposia, as he did [here](#). I believe the work ought to continue and wonder who will pick up the baton and what we can do to ensure the preservation and publication of this important information on a yearly basis. His article supplements resources on the FTSC website, like the [Airshow/Flight Demo guidance document](#) on the Recommended Practices page. Second, as I considered the accident and discussed it with members of my family, I also wondered, "Is it worth the risk?" The question is something we all ought to answer again.

As I pondered, I considered wild ideas like airshows with remotely piloted B-17s, and I quickly recalled another B-17 mishap from August 25, 1952. In the 1950s, a manned USAF B-17 from Duke Field, Florida, was inadvertently shot down over the Gulf of Mexico. The aircraft—piloted by members of the 3205th Drone Group—was the airborne control platform from which a crew member operated the target, a second, remotely piloted B-17. The fighter pilot conducting the live fire misidentified his target. Drones have been with us since the beginning of aviation, and in particular, subscale flight test of unmanned aircraft predates the first powered flight. Flight Test has been telling these stories since 1977, when SFTE's masthead, the Flight Test News, reported that [Remotely Piloted Vehicle System Completes First Automatic Flights](#).

Recently, however, [DARPA and Lockheed Martin](#) partnered for a [full-scale flight test demonstration](#) of an unmanned Blackhawk helicopter. I believe the state of technology readiness suggests two things: 1) flight test of drones will continue and even increase; 2) whether you call them remote pilots or operators, **humans are the most important feature of this testing that will reduce risk and increase safety**. To support this claim, I recommend Crash Course, a monograph published by NASA's Peter Martin. (Download the pdf at https://www.nasa.gov/connect/ebooks/crash_course_detail.html.)

The 2013 book opens with the 1970s era history of the F-15 Remotely Piloted Research Vehicle, a subcale drone used to collect high-fidelity data to inform the spin test program conducted by McDonnell



Douglas and the U.S. Air Force. I recommend the book for this audience, both for the historical context and its relevance to modern technology. In the first chapter, I encountered the name Einar Enevoldson, a name that the younger generation of flight test safety professionals probably has little cause to remember. Einar was the first remote pilot of the F-15 RPRV. His observations about remote piloting and the objective data gathered about his physiological response to the task are both astounding.



NASA photo: F-15 RPRV cockpit

Since the title of the monograph is *Crash Course*, you can probably guess (as I could) what happens at the end of this story, but I found the ending surprising for three reasons. First, it was the test systems that failed and caused the mishap. The recovery chute system proved troublesome for much of the program. I don't know if we are as diligent about test safety planning after we put all the mitigations in place, looking at risks added to the program by test systems. Second, the remote pilots actually intervened and prevented mishaps in some cases. After failures of multiple systems and a failed recovery attempt, a pilot noticed the uplink to the aircraft had been restored. The pilot took over and flew the aircraft to a forced landing on the lakebed at Edwards, thus preventing a crash. Third and finally, the "findings" and determination of "root cause" seems overly simplistic and unhelpful in many cases.

I wish I could do justice to this third, incompletely articulated statement, but you will have to read the words of Dan “Animal” Javorsek in [FTSF 20-08](#) to get the full sense of what I mean. Here’s an excerpt:

Dan “Animal” Javorsek has something to say about determining root cause. In particular, he believes that we tend to make overly-simplistic conclusions in post-mishap reviews and accident investigations, as he states in his own words below.

“...when viewed in reverse, the event appears straightforward to predict. To best demonstrate this...it is convenient to consider a single particle of pollen floating in a glass of still water. After several hours of random collisions with adjacent water molecules, the pollen will have traveled about an inch under normal conditions.”

If Brownian Motion and root cause pique your interest...well, I hope they do and you read the full article.

There is one other topic I won’t be able to address completely in this column, Emergence. Can anyone ever fully address the topic? It’s been discussed at length again this season of Symposia. I recommend an early essay on the topic: The Tacit Dimension by Michael Polanyi. I found a host of applications to flight test safety.

I think you will find a lot of topics that I barely addressed in this edition, but I prefer to think of them as sparks...maybe something in your mind and heart will catch fire. If so, send us a note and tell us what you think.

Turbo Talk

Art “Turbo” Tomassetti

Well, here we are at the end of 2022. Let’s review some highlights for the year.

We conducted two workshops—one in Palm Beach, FL and the other in London, England. Both events were very successful thanks to the hard work of our volunteers and staff. The European workshop was the first one in several years, so I am very excited that we returned to Europe and look forward to planning our next event there. Two observations from my attendance at these events. First, we had a mix of veterans and first-time attendees. Second, we had a very diverse audience for both events. Both factors created great discussion, and hopefully everyone walked away better for the experience.

We continued to publish our newsletter the Flight Test Safety Fact thanks to the efforts of our editor Mark Jones and Contributors he was able to find. We also continued our monthly podcast and surpassed 25,000 downloads. It was extremely rewarding for me to be at events and have people provide feedback on how much they like the newsletter and podcast and how they are using them personally and with their teams. But we know we still have a lot of people out there who are unaware of these resources so we will continue to work to get the word out and would appreciate any help you can give us in that effort.

Just a quick recap because that is what we do as we come up on year’s end. If you were to assess your year from a safety perspective what would be your highlights? I have a few highlights; the interesting thing is none of them have to do with flying. Maybe not so interesting as I hung up the flight suit a while ago. Here is one that just happened. We had a Disney vacation booked for November: Depart on Thursday after my wife finished work and get some of the 6-hour drive done before stopping to spend the night. All interstate driving but most of it would be in the dark. Unfortunately, Hurricane Nicole was making her way across Florida that evening and based on the storm track we would have driven right into it about 30 minutes after departing home. Now despite what my wife says I am a good driver or at least a reasonably good driver. We had park reservations for Friday and with the cost of tickets nowadays wanted to get as much time in the magic as possible. The storm was going to be just a tropical storm by then. I was conducting a risk assessment weighing likely outcomes, severities, odds etc. when my wife said something quite profound “Why risk it?” Well because we wouldn’t have to get up early on Friday. Sure, I could modify our reservations, but that would mean several minutes on the computer. We would have almost an hour less pool time (forget that the forecast was for cloudy weather). “But why risk it?” she asked again.

Suddenly I had a flashback to my flying days and the phrase “Get Home-it is” popped into my head. It has other names like Go Fever and was a condition I suffered from occasionally early in my career. But as I matured, I started to ask myself the very question my wife was asking. Why risk it?

So, the takeaway. This was an everyday, average person, example of doing risk assessment, nothing to do with flying. Get home-itis, Go Fever can sneak up on you unless you ask yourself one simple question, “Why Risk It?”

Until next time: Be Safe, Be Smart and Be Ready.

Turbo

Latest Podcast

Art “Turbo” Tomassetti

You can subscribe to the Flight Test Safety Channel podcast in iTunes, Spotify, Podbean, Google Play, and Amazon Music’s FTSCChannel.

In September’s podcast, Turbo gave a trip report from Anaheim, the SETP’s Annual Symposium. In October, the episode matched the scary theme of the Flight Test Safety Fact. You can navigate directly to both episodes here: <https://flighttestsafety.org/ftsc-news/flight-test-safety-podcast-channel>.

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Connect with us by joining the LinkedIn Group: “Flight Test Safety Committee.”

Website: flighttestsafety.org

You can always send a letter to the editor, like FTE Jeremy S, who shared photographs of Orange Wire from Down Under here: <https://flighttestfact.com/orange-wire-from-down-under/>.

Safety Survey

Ben Luther

Reprint from FTSCF 22-10:
I've produced a couple of posters and flyers that contain a link to the survey. The survey is hosted within Qualtrics (fancy, academic SurveyMonkey). The survey can be completed anonymously, or individuals can elect to provide their contact details to give me the option of a follow up question if they raise something of particular interest. The survey has human ethics approval in accordance with Australian academic requirements.

Ben Luther

The survey gathers your thoughts and experiences working with risk management in complex systems.

It is system agnostic. You are not asked any details that could be commercially or security sensitive.

The subject of research is management practices that remain effective with complex systems.

https://adelaide.qualtrics.com/jfe/form/SV_5gUL5FwLiOZThs2

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Ben Luther



Effective Risk Management for Complex Systems

Flight Test deals with risk. I'm researching to codify what we do. The aim is to benefit the management of complex system projects.