



Flight Test Safety Fact

Published for the Flight Test Safety Committee

BONUS Issue - the preWORKSHOP Edition of the FTSF

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Sunrise and the Waning Crescent Moon - a nostalgic look at the kinds of skills we need to navigate the future of flight test
March Madness RECAP - a short report on how the Tournament went in our office and which rotorcraft was crowned king
The Last Turbo Talk - reflections from the outgoing Chairman of the Flight Test Safety Committee in his last ever column

Flight Test Safety Workshop Highlights

This is the 2024 FTSW *Preview* edition of the Flight Test Safety Fact.

Tuesday, 30 April - 0815 Welcome until 1600L

Two tutorial topics of note: First Flight Anomalies of First Article Aircraft by Roy Martin (Northrop Grumman), and Accident Investigation Board Results From MQ-9 Fatality Mishap, Reynaldo Enriquez (Air Force Test Center)

Wednesday, 1 May - 0815 until 1620L

Featuring many technical talks and turnover of the Flight Test Safety Committee Chairman position

Thursday, 2 May - 0815 until 1200L

Announcement of the Dave Houle Award for Best Flight Test Safety Workshop Presentation (Sponsored by Bombardier); technical tour in the afternoon

Challenge to Attendees (thanks Chia for the exhortation):

1. First, how will you actively capture lessons learned and bring them back to your home organization as you listen to the presentations and the tutorial?
2. Second, and I think, just as important: How will you actively contribute to the FTSW either through questions or coffee break discussions so that everyone leaves better prepared for the “unexpected.”

In both cases, I deliberately used “actively”. I want to challenge our attendees to be active participants at the workshop, not just passive observers.

Sunrise and the Waning Crescent Moon

Mark Jones Jr.

Just the other day, I was taking my high school senior to school in the dark hours before dawn—he was leaving on his senior trip, and the showtime was 6 a.m. As I passed over one of the local bridges, I looked over my shoulder to where the morning civil twilight cast its colors in the eastern sky. A few clouds in the distance acted as an additional canvas for the colorful display, a place for different shades of light to land and cast their shadows, and the whole scene was complemented by the brilliant light of the waning crescent moon. It was stunning.

I was nearly speechless—the glory of the sight was breathtaking, and each beam of light stimulated the memories of a thousand other mornings. I experienced many of those mornings on dark ramps at airports near and far, and on rare occasions, I had the privilege of discovering the sight while I climbed my aircraft through overcast clouds that hid the sunrise. Sunrise from the air is better.

This particular morning was met by the kinds of feelings that are hard to describe. A new day dawned, full of possibility. This was not only a literal observation but also a figurative one: my third child was about to graduate from high school. This moment in his journey represented the start of a “new day” in his life as a young man, one

that is full of possibility. And just like the waning crescent hanging there in the sky, one phase of his life neared completion. Nostalgia, sadness, joy, excitement, and apprehension created a complex bouquet of emotions, not unlike the pleasant but bitter flavor of the coffee I sipped from a foam cup as I cross-checked the road in front of me before looking back over my shoulder at the sky and then at my sleeping son in the car seat beside me.



What is it about the end of one chapter and the dawn of another? The question hits closer to home as I near the end of my military career, one that probably took longer than average because of its composite nature, serving in the reserve component for part of the time and in the civil aerospace industry for part of the time. I still have many years of flying and flight test ahead of me, but for the first time in my flying career, I will be walking away from military flight test for good.

What must I accomplish in the few months I have left to bring closure or completion to that chapter? What must I do to prepare for the next chapter?

The question certainly applies to me personally, but it may also apply to Turbo, who we recognize in this edition as he arrives at the end of his tenure as our Chairman. It may also apply to the new test pilots and flight test engineers joining us as they graduate from test pilot schools or universities all over the world in this season.

As I survey the landscape of my experience, I am nearly speechless, the same way I felt while considering the sunrise and the nearly 135 degrees of sea and sky, bridge and land that made up the scene. In a photograph of the scene, there are more than 1000 by 1000 pixels of multiple colors, and that flood of more than one million pieces of information is overwhelming. I can focus on a few familiar landmarks that I believe will help narrow the scope of my answers to the questions. Thus, what follows is not an exhaustive discussion but a starting point. So first, we consider what lies before us in the day ahead, at least figuratively, as we ponder what the future holds?

One way that I organize my thoughts is to consider the kinds of scenarios we may encounter, as depicted in the table below.

	Routine	Unexpected
Scenarios		

There will be routine scenarios, the kinds of things we expect. Some of these things are linear extrapolations of what we encounter now, but there will also be unexpected scenarios, things we can't predict well. If you like bell curves, you can put the "routine" in the tall, fat part of the bell curve, and the unexpected occurs in the extremes of both tails. (I'll admit that this characterization is simple, but I think simple models are a defensible position that I won't defend here.)

I think we should have the kinds of skills needed to navigate each of these scenarios, which I depict by adding a row to the table below.

	Routine	Unexpected
Scenarios		
Skills		

This new row addresses skills in a similar way. Routine skills are the kind we have now, with perhaps, linear growth or extrapolation based on expected changes. "Unexpected" skills are something else.

A line of questioning follows naturally: How do we prepare for the things we can't perfectly predict? How do we develop skills we don't expect? I hope to come back to these questions after filling the table above with some concrete examples.

To illustrate these futures, consider the following. Remotely piloted aircraft (RPA) have been around for a long time, but we are just now seeing them propagate into routine operations. I refer to this kind of development as a linear extrapolation of what exists today. An MQ-9 Ground Control Station (GCS) looks like a cockpit, and it is controlled like a normal aircraft. It only required a few new "rules" to incorporate the aircraft into Class A airspace, adaptations of lost comm procedures for command and control datalinks.

On the other hand, the jet and rocket engines ushered in a new understanding of aerodynamics and unexpected non-linearities resulting in years of quantum leaps in manufacturing, aircraft design, and other topics. It's safe to conjecture that hypersonic aircraft design will probably bring some kind of "unexpected" scenarios when we do the hard work of engineering something for routine operations in this regime. As far as I know, we haven't mastered the plasma field around the aircraft yet. We know a lot, but the biggest and brightest organizations still experience rapid unscheduled disassembly on their flight test programs, which is empirical evidence that supports my characterization, calling this "unexpected."

	Routine	Unexpected
Scenarios	Remotely Piloted Aircraft	Hypersonics
Skills		

This still leaves us wondering which skills are routine and which skills are unexpected and how to develop both sets. At least, I know it leaves me wondering, but what about you?

I believe that the investing in skills will prepare us to navigate uncertainty with skill, but the margin of this page is too small to contain the argument.

First, do you agree with the examples used to illustrate Routine and Unexpected? What other examples would you give?

Second, how would you populate the “skills” row? What is an example of a routine skill, and what is an example of an “unexpected” skill?

Finally, how does any of this relate to sunrise and graduating seniors and career changes?

I’ll illustrate with a basketball game example before answering the last question. Just the other day, I was watching my youngest son play basketball. Things that I noticed him doing well included getting his hands up on defense, getting in position for rebounds, and cutting towards the basket to get open for a pass. These are all “fundamentals,” skills taught to the young players before adding complicated scenarios. Ball handling and conditioning, as well as movement with and without the ball, and an understanding of the rules are all routine skills.

On the other hand, the first time he sees a new play with a double screen that gets the shooter open for an inbound pass—he might think it’s unexpected, but each of his routine skills will help him execute the play. Furthermore, if something doesn’t go as anticipated—which could include a teammate missing a cue or even an opponent behaving in an unexpected way—he can respond by executing routine skills. That example illustrates both routine and unexpected scenarios and also the idea of routine skills.

In the closing chapter of a high schooler’s senior year, it’s a great time for me to think about whether I have equipped my son with the skills he needs to enter the next chapter. It’s also important for me to prepare him mentally for the unexpected things he will encounter and remind him that he has the skills to navigate the uncertainty with confidence. (I’m not sure I’ve successfully argued this point, but it is something I will return to in the next column.) I could apply the same advice to myself in the final months of my career as a military test pilot. Additionally, I need to make sure I continue to execute the fundamentals with diligent excellence as I near the end instead of getting distracted by the finish line.

You should too—you should consider how prepared you are and avoid both apathy and stagnation. You should take a look at your fundamentals, your skills. If they aren’t getting sharper, they are getting duller. This train of thought is similar to what Turbo presented in his talk “Better Lucky than Good,” which would be a good thing to watch again for another perspective on this topic.

In closing, I urge you to look at the two questions at the top of this page—one more time—especially in the context of the 2x2 table above, and think about your fundamental skills. Send us your thoughts. One of those fundamentals needs to be appreciating a beautiful sunrise on the walk across a dark flight line. Send us your photos too. And in the next column we will answer the burning question: What is an unexpected skill, and how do we get them?

RECAP: March Madness: The Greatest Airplane of All Time

Mark Jones Jr.

We made it happen in our office, a March Madness style bracket tournament that only looked at rotorcraft and VTOL aircraft. It all started one day when I asked a young Tech Sergeant (E-6) what he thought about a certain kind of rotorcraft. He didn’t know what it was, so I asked him to do some homework. While he was learning about this particular rotorcraft (which I can’t remember), I asked him to fill out a bracket that consisted of sixteen total rotorcraft, a fairly good sample that included old and new, military and civilian, domestic and foreign.

Then we spent a week voting on each “matchup.” In the last round the MH-53 PaveLow, a USAF special operations helicopter, went head to head with the UH-1 Huey, a classic in the category. In the end, the Huey pulled ahead and was declared the ultimate winner.

The event made two things happen. First, it gave some of us older aviators the chance to invest a little bit of knowledge about our heritage in a younger aviator. Second, it gave us some fun. What about you? Did you take

the dare and run a tournament? If so, we'd love to hear about it—either by email or when you run into us at FTSW in a few days. I hope to see you there.

Flight Test Safety Committee - Calendar of Events

Flight Test Safety Workshop

When: 30 April -2 May 2024

Where: Hyatt at Olive 8
1635 8th Ave
Seattle, WA 98101

<https://www.flighttestsafety.org/workshops>



The Last Turbo Talk

Art "Turbo" Tomassetti

Hello everyone and welcome to the final episode of Turbo Talk or at least the final episode for me as chairman of the Flight Test Safety Committee. Tom Huff, the previous chairman and my mentor on the committee, started writing an article for each edition of the newsletter. When I took over, I thought that it was one of the responsibilities of the chairman, so I started writing them. Mark Jones, our editor, decided on the Turbo Talk title. I have realized that there was nothing in the FTSC charter or written down anywhere that directed the chairman to provide an article for each edition, but it seemed like the right thing to do. And if I am being honest, it was another opportunity for me to do my part to contribute to the Flight Test Community.

So now as I write the final one of these, I find myself wondering if they did have an impact or make a difference. I don't think I could really put together data to prove that it did. I couldn't even prove that people read the articles for that matter. Sounds depressing right? But here is the thing, in some ways it is analogous to things we do for safety in aviation. You can't always prove that they have an impact or make a difference. Sure, we may anecdotally be able to make some inferences, but hard data to show measurable increases in safety can be very hard to come by. How much easier would it make the life of the safety department if they could show management the return on investment for money spent on safety? But we do it because we know as aviation professionals it is the right thing to do.

It has been an honor and a privilege to serve as chairman. I am "all in" on the committees mission:

To promote flight test safety and continually improve the profession's communication and coordination. Being a part of that and working with others to try to accomplish that is truly rewarding. My role as chairman really was to just enable the incredible team we have on the committee, our support staff, and volunteers to accomplish that mission. Thank you to that amazing group of people.

← Post



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Honored to host X-35 test pilot Art "Turbo" Tomassetti onto the podcast.

This episode we discuss flight test 101, X-planes, groundbreaking missions, autonomous flight, and much more: youtu.be/FRMrhqqEFnE



11:52 AM · Apr 9, 2024 · 2,520 Views

Finally thank you, all of you, for reading this newsletter (and of course the part that I wrote). We all have a lot of stuff sent to us or material out there to look at. But you have taken the time to read something we hope is promoting safety and improving our profession. And maybe you can't prove with data either of those but if you're like me you know it's the right thing to do.

If you are already starting to miss me don't worry, you can see me in person at the Flight Test Safety Workshop next week (but you do have to register for that). And you will continue to hear me through your earbuds, headphones, or speakers each month on our podcast.

Thank you everyone again for this opportunity to serve as chairman and be a part of the right thing to do. Until next time, sorry scratch that let's go with...

Remember - Be Safe, Be Smart and Be Ready.

Turbo

Latest Podcast

Episode 52 was a special First Flight episode and includes a link to a paper written by the subjects of Turbo's Interview. You can subscribe to the Flight Test Safety Channel podcast in iTunes, Spotify, Podbean, Google, and Amazon Music's FTSCChannel.

You can also share the link: <https://flighttestsafety.org/ftsc-news/flight-test-safety-podcast-channel>.

SPECIAL Podcast

Those of you who have a keen eye may have noticed a special interview conducted by @hermeuscorp on twitter (see photo above). Check out Turbo's interview [online](#).

Contact the *Flight Test Safety Fact*

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