

Flight Test *Safety* Fact



Published for the Flight Test Safety Committee

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Another Look at the Flight Test Safety Database

Taylor Oxford

“So this vehicle presents an interesting hazard. How are we going to mitigate it?”

“I don't know. Let's go ask one of the old guys that's done this type of thing before.”

“There's only one problem with that. This is a new technology. No one here has tested anything like this before...”

This is the type of conversation that has likely come up at many different eVTOL companies.

<https://ftsdb.grc.nasa.gov/>

With these types of vehicles, so much of the technology is new; yielding unique configurations and safety challenges. The same issue was discussed by Marty Shubert at the previous Flight Test Safety Workshop in Wichita: developing new test teams to support testing of new designs. Literally hundreds of different companies have eVTOL designs ranging from the company of hundreds to the couple of folks in a garage.

The conundrum becomes how do we safely test without the years of experience to back us up? It's with this problem that I decided to approach the [E-VTOL Flight Test Committee](#) with a possible mitigation, The Flight Test Safety Database (FTSDB).

I had previously been in discussion with SFTE Director, Tizi Bernard, about what he had been doing recently. He mentioned that the tech council was looking at bringing back the Flight Test Safety Database which had languished over the past few years. I shortly thereafter went searching the FTSDB for any information that would help me in the eVTOL world. Unfortunately, my search for "battery" yielded hazards regarding stall chutes failing to deploy and needing to have fully charged batteries as a mitigation. Definitely not the electric propulsion support I was looking for. However, this database could become significantly more useful to eVTOL OEMs if companies shared and contributed what they had discovered. In the past, a major source of unity within the Flight Test community has always been willing to share safety related information and lessons learned. With this, I made my pitch to the eVTOL FT council.

A quick 20 minute presentation was received with agreement on the usefulness of the FTSDB and, as expected, a few folks that were skeptical of their respective companies allowing them to share possible proprietary information. This put the FTSDB right about where I expected it. Mostly positive reaction to a method of improving safety, but it needed more than a pitch to move the idea to the end goal.

I approached Jen Uchida, current SFTE president, on submitting some of her THAs from an electric aircraft project she had been a part of. She agreed and submitted it to the database. So, the first had been submitted, but still more are needed.

Now if you are reading this article, I implore you to contribute to the Flight Test Safety Database and increase the overall safety of the eVTOL and electric aircraft communities. The process is fairly simple, registering on <https://ftsdb.grc.nasa.gov/> and submitting your THA through the easy-to-use form. The THA approval process can take a few weeks, but that allows for the THAs to be peer reviewed ensuring the quality of the information in the database.

Please consider submitting to the FTSDB and improving the safety of the industry.

Taylor Oxford

Editor's note: Some parts of the Flight Test Safety Database may not be fully functional. The FTSC has a project underway to improve it, and your use of the Database may inform their efforts and its utility.

Jonathan Lindsey & Michael Remaly win '23 LeVier Award

Andrew Bankston

Jonathan "Spock" Lindsey (Experimental Test Pilot, Boeing) and Michael Remaly (Test Director, Boeing) are members of the V-22 Integrated Test Team at Naval Air Station Patuxent River. In an effort to improve the collaboration of aircrew and telemetry (TM) personnel during high risk flight tests, they reexamined the risk management process of the test team. In recognizing the critical role that TM personnel play in the safe execution of test flights, Spock and Mike decided to add TM into the risk management process normally reserved for aircrew.

The operational risk management (ORM) process used by V-22 aircrew utilized a checklist that had evolved over many years and was based on the checklist in use at the US Naval Test Pilot School. Since 2014 this checklist has successfully identified increased hazards to test flights and directed a series of risk mitigation discussions prior to and during test execution. This analysis of hazards went beyond those hazards identified in the test plan as they were largely based on test day conditions with respect to the aircrew, mission, aircraft, and environment. Assessment of these test day hazards occurred at the flight brief, and certain thresholds of elevated risk triggered reviews with peers or team leadership prior to proceeding with the flight.

In 2021 as the team continued to develop the aircrew ORM checklist, it became evident that TM personnel played a critical role in some of the methods used for mitigating risk. Additionally, it became widely recognized among team members that the human factors associated with risk management also applied to TM personnel in the execution of their duties in the telemetry room. In light of these assessments, Spock and Mike developed a new ORM checklist specifically for the purpose of assessing and mitigating risk associated with the TM crew, mission, instrumentation, and control room. This checklist mirrored the format of the aircrew checklist and came to similar thresholds of reviews from peers or team leadership. Furthermore, a combined total of points from both the aircrew and TM checklists could also trigger a review from team leadership prior to proceeding with the flight.

While the earliest versions of these ORM checklists did not claim to perfectly capture all elements of risk to the test event, they did successfully provide a forum for risk assessment and mitigation discussions. They brought these discussions from a repetitive routine of reading through test plan hazards to an in-depth analysis of test day considerations for mitigating risk. Working through these checklists also grew a climate of commitment to flight test safety where everyone in the flight brief was empowered to express concerns to the plan and admit to any increased hazards that they might bring to the flight due to human factors. In the process of using these ORM checklists and the appropriate discussions that have followed, the test team has been able to make risk decisions at the right level resulting in a spectrum from proceeding with caution to amending the plan for the test event to canceling the test event altogether.

Spock and Mike spearheaded this effort by collaborating on the development and refinement of the checklists. Afterwards, they supervised the rollout of the updated process by providing training to the test team and putting the process in action during actual test events. During briefings for these test events, they set the example for the team in how to wisely assess mission hazards and how to appropriately discuss human factors. Moreover, they took the lessons learned from the implementation of this process and shared those lessons with other test teams at Pax River. Their efforts to formalize and improve the safety processes at the V-22 Integrated Test Team have facilitated continued success of the team while continuing to nurture a positive safety culture.

News of Note

We should all be paying attention to the advances in “air taxi” technology, the state of regulations and certification, and the effect of AI and related technologies on flight test safety. The following articles provide interesting updates.

NASA delay X-59 Flight

<https://www.ainonline.com/aviation-news/aerospace/2023-10-15/nasa-delays-x-59-supersonic-first-flight-next-year>

Hermeus unveils its Quarterhorse Mark 0 - of particular note are the details they share that outline their build up approach and some interesting photos of the “cockpit” and test article, more than the usual corporate press release

<https://www.hermeus.com/blog-quarterhorse-mk-ready-for-test>

The EHang 216 has been type certified by China. Hype or history-making moment? You decide.

<https://www.urbanairmobilitynews.com/air-taxis/what-ehangs-eh216-type-certification-means-for-the-global-aviation-industry/>

Two headlines from the daily news *1440* sum up the “state of the art” of the poorly named “AI”:

“Researchers release tool that adds “poison” pixels to images that can corrupt AI models, which use the images to train; tool can trick models into producing photos of cows after training on images of cars

<https://www.engadget.com/new-tool-lets-artists-fight-ai-image-bots-by-hiding-corrupt-data-in-plain-sight-095519848.html>

California suspends permits for General Motors' autonomous vehicle subsidiary Cruise to operate self-driving cars in San Francisco, citing public safety concerns

<https://sfist.com/2023/10/24/california-dmv-suspends-cruise-robotaxis-from-operating-in-sf/>

Is ChatGPT getting dumber?

<https://futurism.com/the-byte/stanford-chatgpt-getting-dumber>

Vertical Aerospace Details Failure Sequence that Preceded VX4 Crash

<https://theaircurrent.com/aviation-safety/vertical-aerospace-details-failure-sequence-that-preceded-vx4-crash/>

This last article is probably good kindling for a future discussion. Some, including the NTSB, are outraged that the company is talking publically. Some organizations, like SETP, have taken a deliberate stance to disallow speculation about accident causes. On the other hand, the Air Safety Institute arguably encourages the kind of thought experiments that speculation encourages and publishes videos to that end. I think speculation is part of the scientific method, and we push it out of the spotlight when we forbid it, thus losing access to its benefits. I also wondered if STPA would have helped.

Turbo Talk

Art "Turbo" Tomassetti

Hello all and welcome to November. A few thoughts on this time of the year. Let's start off by congratulating everyone on surviving the scariest night of the year. A night where ghosts, goblins, zombies, vampires, and various other spooky specters roam the streets after dark. And while we are on the topic of frightful things go check out October's podcast for a terrifying tale of a haunted, cursed, or at least problematic aircraft 163666.

November also brings us to the end of hurricane season here in the US on the 30th of the month. Living in Florida we start to cautiously breathe a sigh of relief that those major Mother Nature events take several months off. But it isn't quite over yet, just like the flight isn't over until the aircraft is parked, chocked and the engines (if you have them) are shut down. I can think of two episodes in my flying career when the bad thing happened after landing and clearing the runway. Like the saying goes, "It ain't over til it's over." Quick who knows the origin of that saying?

Lastly this is our first edition since SFTE and SETP completed their major symposia for the year. I attended the SETP event in Anaheim and as always came away better for the experience. I have talked about attending these events before in this newsletter and on the podcast. If you do flight test, these are events that will give you tools and ideas to be better at what you do. They are also great opportunities for networking. If you are at or contemplating a career transition, going someplace where you can talk to lots of people from a variety of places within the aviation industry seems to me like a pretty good idea. Even though I am not actively doing flight test, I found guests for several more podcast episodes, got ideas for two presentations I will put together and most importantly stayed connected with the profession. I also had some fun...

We re-created a photo from the first SETP Banquet in 1957.



And I got to wear my shark hat. (Explanation needed but not provided)

As always thanks to Mark Jones for putting this edition together and Susan Bennett for working finalizing and distribution.

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



Turbo

Latest Podcast

Art "Turbo" Tomassetti

Episode 47 is a "Halloween Spooktacular": Aircraft Bureau Number 163666 had a black tomcat with demon red eyes painted on the tail. What could possibly go wrong?! A special halloween themed episode again this year about another seemingly cursed aircraft, this time an AV-8B Harrier. Join Turbo and his guest Kevin "Smells" Gross COL USMC (Ret) as they recount the terrifying tale of aircraft 163666.

Don't miss last month's **EP 46 – Are You Ready For the Bad Day? Part Two** — You can subscribe to the Flight Test Safety Channel podcast in iTunes, Spotify, Podbean, Google Play, and Amazon Music's FTSCChannel. You can also share the link below with colleagues and friends



who may not know about Turbo's monthly recording and navigate directly to the podcast: <https://flighttestsafety.org/ftsc-news/flight-test-safety-podcast-channel>.

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