

## **Aerospace Unplugged – Pilots' Perspective: The Next Era of Aviation Safety**

### **Adam Kress**

Hi, everyone, and welcome back to another episode of Aerospace Unplugged. I'm your host, Adam Kress, and today's episode safety is the focus. And we'll be looking at aviation safety from two vantage points, one from the perspective of the pilot and the other is from the perspective of someone who has studied pilots and helps to actually design the cockpits that pilots use.

Now, as you all know, aviation safety has been in the spotlight, specifically in the U.S, especially since the tragic collision of a passenger aircraft and a military helicopter in Washington, DC early last year. There have been other aviation tragedies in the U.S. and around the world over the past 18 months, at a rate higher than any of us in the industry would like to see.

Now, while flying remains far and away the safest form of mass travel. The job of improving safety is never done. With my guests today, we'll explore how aviation safety is rapidly evolving. We'll also take a deeper look at the unique role that pilots play in influencing aviation safety efforts. So let's get down to it. Joining us back on the podcast today is the Thea Feyereisen.

And she's a distinguished technical fellow at Honeywell Aerospace for years a leading expert in human factors and a recipient of many awards in this field. She's also a fellow in the Royal Aeronautical Society and a member of the National Academy of Engineering. And she's widely recognized for advancing aviation safety through human centered design.

Also with us today is Captain Steve Jangelis. He's the aviation safety chair at the Airline Pilots Association known as ALPA.

### **Adam Kress**

As part of ALPA, Steve is responsible for the safety matters of over 80,000 pilots at 42 airlines in North America. He's also the former industry co-chair of the FAA's Aviation Safety Information Analysis and Sharing system. And he's a current member of the US Aviation Safety Team.

Steve also brings extensive safety and operational experience and is currently a line check and flight standards pilot on the Boeing 757 and 767 for Delta Airlines. Thea, Steve, thanks for joining me on the podcast today.

### **Thea Feyereisen**

Happy to be here.

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### **Captain Steve Jangelis**

Glad to be here.

### **Adam Kress**

So I know I've asked Thea this in the past because she's been on the podcast, but, Steve, I'm always curious to know how people got into aviation. Did you fall in love with it as a kid, or did you take a career turn and went there?

### **Captain Steve Jangelis**

This obviously was something I wanted to do right from day one growing up. As soon as I could start reading books in the sky, saw airplanes. My parents, much to their dismay, we like, well, you should go to law school or be a doctor or an engineer. Buy you know, they were always there for me. If I had good grades, they would take me to the airport to go watch airplanes. So that was a reward for me. Instead of an ice cream cone, I could go look at airplanes. So growing up, it's been in my blood, been in my DNA. My father was a private pilot. My brother is aviation as well, and it's something I've always wanted to do. But I went to the civilian route and got all of my ratings and then, you know, did some flying, basically gaining experience and working my way up to Delta Airlines where I am today.

### **Adam Kress 8:24**

Okay, excellent. So you've been flying a long time. So you've seen the industry evolve, you've seen some safety standards evolve. If you look at the past, say, 5 to 10 years, how is the conversation around aviation safety evolving within the industry? And with pilots and are there certain topics that have grown in importance.

### **Captain Steve Jangelis**

There has been a sea change since I got on with my current employer, Delta Airlines. I've been there just over 25 years. We've seen a difference in state safety issues that have come to the top of the list for us to mitigate. Issues like new vehicle integration, we weren't talking about commercial space or drones 15 years ago. We're seeing that as a safety risk and which needs mitigations out on the horizon. Issues with spectrum as I'm sure some people may be working on that inside of Honeywell, on just, you know, radio altimeters, avionics, equipage, things like that, that's a risk that we've seen as the telecom industry is expanding. You know, before we used to have wired phones in the

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wall. Now we have cell phones in our pockets and obviously the telecom industry wants to expand that capability. So that's a big risk for us.

Another topic is pilot fatigue. Before, you know, pilots didn't work as much, just like a lot of the workforce in in in the world today. We're being asked to do a lot more. And so, you know, fatigue is a real issue, which is taking scientists to look at and realize where we are with that and how do we mitigate the risks from that. Also just workforce turnover. We have there are more airplanes out flying today than ever before and it's going to take pilots and maintainers and folks to design them and run them and operate them.

So obviously we've seen a new generation of people in our industry and also just, you know, data. Data is a huge thing. We never used to get information from aircraft. Now the aircraft talk about a whole flight and can download the minute you block into a gate so we can learn about patterns and issues and maybe some safety data we can gather from the aircraft right when it hits the parking brake. So some big things out on the horizon. It's an exciting time to be involved in aviation. I'm just happy to be a part of it.

### **Adam Kress**

Thea, I want to get your perspective on this as someone who's been in the industry a lot of years and has seen things evolve. First off, from a human factor standpoint, take one second and step back and help explain to our listeners kind of a general overview of what human factors in aviation is, but then same question to you in the next five to 10 years, how would the safety conversation evolve?

### **Thea Feyereisen**

Yeah, so I've been with Honeywell for 30 years and before that I was Bush pilot in Alaska. So I also live and breathe aviation and air transportation and came into human factors really on the safety side and interested in safety and kind of, you know, looking at accidents and the contributing causes to accidents and you know, Steve mentioned fatigue. Fatigue, whether you're in the in the cockpit or the tower, that certainly can play a contributing role.

Things I've seen lately changing in terms of safety is a couple of things. What runway safety, runway, you know, aircraft doubles every 15 years. So like Steve was saying, we got more and more pilots, we got more and more planes. We don't have a whole lot of,

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runways don't double every 15 years and so we see higher density of operations and more near collisions on and near the ground. Another area of change evolving is GNSS jamming and spoofing.

You know, in the US, we don't experience a lot of that. But you fly over, you know, in more contested parts of the world, it's an everyday occurrence. Well, you know, the industry moved over to more GPS dependency, right, decommissioning ILSs across Europe, for example. But now these vulnerabilities of GPS are emerging as well. So I think, you know, I echo some of Steve's hot topics with, you know, pilot fatigue, increased density operations. But yeah, those are some of the increased safety areas and of course changing demographics as well, both in the cockpit and in the tower.

### **Adam Kress**

Steve, you touched on it, you both touched on it really just like more traffic, more planes, not necessarily more airports than run lanes. But how are pilots, you know, working for an airline, Steve, for example, impacted on that, from a day-to-day perspective and do you, do you feel it from a safety perspective? Like my goodness, it's just busier and busier.

### **Captain Steve Jangelis**

Oh, 100%. Obviously when I first started flying right around 30 years ago, as I date myself, you know we didn't have the traffic flows that we had. And right now we have a number of aircraft that we never would forecast, you know, 30, 35 years ago. Not only were just talking about airliners, which is the people that I represent.

But corporate jet sales have hit record levels year after year after year and obviously Honeywell's equipment is on board all of that aircraft and it's great for the bottom line. But trying to figure out where to put those aircraft is has been the toughest part and as we see more and more aircraft being put into the system, more vehicles being put into the system, you know, it does add to some pressure. Obviously, you know, trying to get landing clearances at an airport that only allows 80 operations per hour, but the airlines are scheduling for 100 operations an hour, it can provide us with some delays, some holding opportunities and you know we hit it on the head about runway safety now more than ever, it's very important for us to be paying attention as we maneuver around the surface and obviously Honeywell's equipment is going to help us pilots out with that technology and we are really encouraged by some of the things that you folks have been working on.

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### **Adam Kress**

So let me shift gears now a little bit to a different area of aviation safety and that's air traffic control modernization.

### **Adam Kress**

ATC modernization is another hot topic in Washington right now. Late last year, Honeywell Aerospace held an Aviation Leadership Summit that FAA Administrator Bryan Bedford spoke at and he specifically addressed the topic of ATC modernization. So I want you guys to take a listen then I'm going to ask you a question.

*“And how can we switch from a high variance, high dependability NAS to a strategic approach on how we design airspace? How do we collaborate with industry looking at schedules that are being built four or five, six months into the future, turning the whole process around and not just asking how many flights are we going to have, but we want to know when do you want to arrive? We'll do all the deconfliction through strategic TR trajectory analysis. We'll do that and then we'll tell you when we want you to leave. So airlines don't have to pad their schedules by 30 or 40 minutes in order to ensure an on-time arrival.... we are going to see something in the neighborhood of a 20% opportunity to improve capacity throughput, reduce the amount of time and space for our aircraft, taking advantage of the technology that's on the planes, and certainly delivering a safer product because we'll have this stuff deconflicted from the start versus every sector that you fly through today and you get a handoff.”*

### **Adam Kress**

As you heard, Administrator Bedford assessed both capacity and the safety benefits with modernized airspace. Just curious to get your general take on this vision. Steve, we'll start with you, but on ATC modernization efforts overall.

### **Captain Steve Jangelis**

Well, obviously it's well overdue. It's a noble cause. I think that the DOT Secretary Duffy and FAA Administrator Bedford are on the right in the right direction trying to re-modernize our system. It is well past its years. It worked great in 1975, but it's not good for 2026. So I think it's great work by our government to reorganize this. Obviously as

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we've heard, 12 1/2 billion dollars came through in the bill last year and that's just a down payment as the totals are starting to roll in.

Obviously contractors are being brought in to bid for some of the work, but again, it is only a down payment. And so what I'm hoping for is that there are, there's some good guardrails up because if we don't get the 12 and a half billion right, I don't think we're going to get any more money past that and so my organization is taking a very hard look and working with our folks at the GAO, working with the congressional members and the Senate, and speaking with them and saying, look, you know, we need more. We're going to do well with this. This is not just a big spending spree. We're going to put this and with a targeted action for the industry and I think it's going to take everyone from OEM's to the air traffic controllers to the government, the FAA, pilots, airlines, everyone's going to have to be on board. And from what I have seen, I'm very encouraged everyone is on board, so again, I think that you know we're going to have to analyze and see what comes up in this modernization program, but I'm really encouraged and optimistic that we're going to get it right.

### **Adam Kress**

Right. Thea, I want you to take a look at ATC modernization more you know through your human factors perspective and we're going to get to runway safety more specifically a little bit later. But when you think about some of that antiquated technology that's currently used in air traffic control towers. And when you think about the communication between controller time, in your estimation, what needs to change? What needs to improve as part of this model?

### **Thea Feyereisen**

Well, I am encouraged by what I hear as a tone shift in DC and across the industry. You know, we have a down payment, right. I think, you know, that's acknowledgement that where we're at right now is not sustainable, you know. So excited to see some of the infrastructure enhancements happening. But it's, you know, as a researcher and a product developer, it's it has been frustrating that the NextGen program, right? We've had a couple decades of NextGen and some of the great enablers like ADSB out and ADSB in, we're not realizing the benefits because aircraft aren't equipping and so that you know from a safety perspective ADSB in which came out of NextGen you know we need to take the next step now. You know, we need every everyone in the mixed-use airspace to be sharing their position. But then we also need to get pilots the information. Air traffic control is important, but pilots are equally important. They need access to that information as well.

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### **Adam Kress**

Thea, you mentioned the term mixed-use airspace. That takes me perfectly to my next question, which is around advanced air mobility. A lot of these start-ups are trying to get EVTOLs into service to move passengers, to move cargo, getting back to what we said earlier, more aircraft in the sky doing more things than ever before. Steve, from your perspective, how do you feel about this, this integration, this, I would say this upcoming integration of more advanced air mobility vehicles into the airspace? Is it something you don't worry about too much because normally you're so far above where there would be, or does it just seem to kind of complicate everything as well?

### **Captain Steve Jangelis**

Well, we're looking at it with very cautious optimism. Obviously the secretary just announced a new initiative in certain states to do more testing and more integration, operational testing. And you know we are very encouraged by what we have seen so far. But one thing is for certain, aviation right now, commercial aviation, flying people from point A to point B, passengers, cargo are getting to where they go without much delay or mishaps or accidents. And we have a very high safety rating in commercial aviation and we want to make sure that it stays that way. Obviously, you know, you pointed out that you know, well the vehicles that we're speaking of might be lower than you are, but you know, we're all sharing that same airspace from 1 foot to 10,000 feet. It's all the same airspace, no matter what the vehicle is. So you know, we are encouraged, we're integrating and working with those manufacturers to speak with them, whether it's a drone or commercial space vehicle or AAM operations as you pointed out earlier.

You know, obviously they're going to be operating in our airspace and in fact some of our airlines are partnering with some of those vehicle manufacturers to shuttle passengers to a hub airport to then fly them on to a further point. So this is going to be part of our ecosystem. And we are headstrong and working together with them to try to find the safest operations that are out there. Again, we are strongly behind testing for now segregation for operational purposes and then we eventually lead to an integration and obviously that's going to take technology, it's going to take human in the loop and it's overall going to take leadership and guidance from the regulator themselves.

### **Adam Kress**

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You mentioned that the airlines are starting to partner with some of these VTOL companies to go from point A to B to C really. But that's also going to mean that the transitioning here to Thea in runway safety, that potentially there is even more traffic on the ground or near to the ground in airports.

We've seen in recent years an uptick in in serious incursion and excursion kind of incidents that happen on busy runways. Do you see a common thread here between these types of incidents? And what factors do you think are playing into the rise we're seeing in the more serious close calls?

### **Thea Feyereisen**

For runway safety, I think we've pulled on some of those threads already, increased density of operations, changing demographics, you know, both in the cockpit and in the tower. I think another one that we haven't spoken about yet is kind of the increased demands on the pilot, you know, during taxi, right. They're head down putting in last minute load updates or passengers or fuel load, you know they've gone, you know the role of the pilot over the last couple decades has changed from actual physically flying the aircraft to being more systems manager and so instead of you know, looking out and taxing, you know, they're kind of getting sucked into some distractions in the cockpit.

### **Thea Feyereisen**

And the increased demand being put on pilots, whether that is loading in last minute manifest additions and you know another thread we talked about was pilot fatigue, right, coming in, landing. You know in Europe they've got controlled crew rest where pilots can take a controlled nap in place for 15 minutes. So when you're coming down, you know top of the descent set, you're in the game and you're at your peak alertness level. I would like to see us look into some of some of that as a potential.

### **Thea Feyereisen**

We know that the biggest collision in aviation was at Tenerife. That was a collision between two 747s. Over 500 people died in that situation. Looking at the trend data, there's been an increase in upticks. I say that the near collisions are getting nearer and nearer and the only thing that is avoiding from disaster many times is the pilot and getting pilot the tools so that they're aware of the hazard. They're the ones that are going to hit the brakes. The pilots are the ones that are going to do the go around. Yeah,

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I'm all for air traffic control having the tools as well, but it's the pilots that really need the immediate awareness of a potential collision.

### **Adam Kress**

So Steve, this must be interesting from your perspective as a pilot who's flying all the time. There's this balance between, you know, humans and technology. How much do you automate in the cockpit to help pilots? Honeywell Aerospace makes alerting systems that go into cockpits that help warn of a potential collision on the ground. From your perspective as a pilot, how do you strike the right balance between the technological automation and still having the controls in your hands?

### **Captain Steve Jangelis**

Well, I can tell you this is a very personal subject for me. I was on board an aircraft that landed over the top of a 737 that was in position on a runway at night. We had 303 people on board my aircraft, 67 people on board the aircraft on the ground. We were cleared to land twice by the air traffic controller and we never saw that airplane. It was ruled not our fault. They said it was controller error. That controller didn't come to work to cause that problem or to make that error. But even the human in the loop didn't see it. We never saw the aircraft. It was at night in the rain and you know when you've got your wipers you know, flapping back and forth during the rain, sometimes it's tough to see things. We never saw the aircraft. This is what got me involved in this work. This is why I do safety work for the Airline Pilots Association is so that this doesn't happen and I had the fortunate time and availability to go out and fly your Honeywell 757 test bed. As a 757 pilot, I jumped all over that invitation and got to see your runway safety portfolio in action and that would have saved us that night. Obviously nothing happened, but that would have eliminated that risk. I'm very impressed by the product. I appreciate the developers and who put that together and I would just wish that all of our air carriers that are inside my organization would adopt and purchase the equipment.

### **Adam Kress**

Excellent. We appreciate that very much, Steve. We've talked about a variety of different, what I call threats to safety and it's come up a few times. You guys have mentioned pilot fatigue. I know Honeywell Aerospace has done research into that as well, primarily out of the labs that we have in Europe. But Steve, what's the best way to address pilot fatigue? Is it one thing? Many things?

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### **Captain Steve Jangelis**

Well, I could tell you one thing. For those of us here on this podcast, we fatigue differently. You know, folks can, it's not an exact science. And I think that's the big key there is that fatigue mitigations are individual issues, you know, someone, as you age, can fatigue differently. Younger folks seem to have a little better resilience when a long day, you know, approaches them or lack of sleep. So you know, we have pilots of all demographics and you know, it depends whether you're a person that lives up in the mountains.

Obviously you're more acclimated to being at altitude. When you get to altitude, when you fly, it tires you out. So looking at fatigues, it is now looking at fatigue issues. It is now a science and it's not just a guess. We've been working in the industry, working with the regulator, working with vendors, working with actual scientists on what is fatigue, how do we measure it and what do we do? And so what we found is that there are patterns when pilots fly more that might be fatiguing and so they're flagging those issues and airlines are using them to build schedules. What was just put together to say, hey, look, let's put these employees and let them fly from point A to point B and C, D and E. Now we've said, hey, you know what, maybe by leg C, they might be a little bit tired. Let's consider putting them in the hotel because obviously a crash is where no one wants to be. And we have seen and there have been accidents with probable causes listed as pilot fatigue. And so airlines and industry and the regulator are getting smart on this and you know we're ready to ready to work with whoever wants to make sure our pilots are ready and rested. And one point I'd like to make is, is that as we, spoke earlier about the foreign carriers that are flying 2 pilots across the ocean. We think that is a great idea. We think 3 pilots would be best. That mitigates fatigue the most. So you know 2 pilots on board that are well trained, well rested are the best safety device in any aircraft today.

### **Adam Kress**

Thea, I'm curious to get your perspective on this. You know, more from a maybe not necessarily a cockpit design standpoint, but what are some sort of things that you could do with technology that help alleviate it?

### **Thea Feyereisen**

So there certainly is technology that can detect pilot drowsiness, pilot fatigue levels.

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Yes, as Steve mentioned, scheduling is a big part of it and fatigue does hit everyone individually differently. You know, older demographic tend to be more susceptible, but you know the younger folks, they've got babies at home that are waking them up, interrupting their sleep as well. And so I think, you know, showing up while well rested and scheduling, but certainly there are mitigate, you know, technology detection methods that can be employed, you know, in the flight deck, whether that is, whether that's cameras, whether that is heart rate monitors, you know, breathing, you know, there's different ways that we can detect pilot fatigue. What do you do about it, right? That is a little bit more of the trick. You know in the military, you know they would, they would give them some stimulant or something like that. You know, maybe it's time for your coffee break pilot. We could do something like that. But yeah, it's the actual technology interventions. I think that is still some opportunity space, but certainly the detection of certainly drowsiness, sleep, sleepiness, incapacitation that is possible with today technology.

### **Adam Kress**

On the technology front, of course you can't have any conversation about any industry at this point without thinking about artificial intelligence and where that's taken. So when it comes to aviation here and AI in particular, going back again to late last year when Honeywell Aerospace held its Aviation Leadership Summit, Transportation Secretary Duffy was there, and he had some thoughts on AI that I wanted you guys to hear.

*“So yeah, we didn't know that at the time, but there were 85 near misses in the three years prior to the crash. And someone should have seen that and said, this is too dangerous. We need to take corrective action. We can't have fixed wing aircraft and helicopters crossing paths in the Potomac. It should have been a no-brainer. We shouldn't have allowed that to happen. But we learned from that in that, well, if there's hotspots at DCA that we're not seeing, are there hotspots elsewhere in the NAS that we're not seeing as well? And so we've been using AI to look throughout the NAS and find airports where we do have issues that we have to resolve. And so that's what we've done and we've been able to identify those and try to take action early.”*

Thea, we'll start with you. What's your take on what he said and how AI might influence aviation and the cockpit in particular over the next decade?

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### **Thea Feyereisen**

I think you know AI definitely is and can play a role in assistance of you know whether it's detection of trends, you know looking out for you know what approaches you know simple rule base can also reveal some of that. So I think we're hopeful and optimistic of a role AI can play, whether that is in spotting trends, hazardous trends, as well as providing assistance to controllers, providing assistance to pilots. I think there's, you know, what we think today and what we think next year might be vastly different, but certainly is a hot topic and everyone is looking, you know, for ways to leverage AI to maintain our safety and even improve our safety record in transportation.

### **Adam Kress**

Great. Steve, I'm kind of asking you now to speak on behalf of all the pilots you represent. But what is the general thinking among the pilot community right now about AI integration into the cockpit? Is there more of an openness to it? Is it changing? Is there a lot of hesitation?

### **Captain Steve Jangelis**

Well, one of the key things AI is providing us right now today is data analysis. As I mentioned earlier, aircraft, you know flight data recorders are sending down information many, many megabytes a second down through satellite connections, down to ground control systems and we're able to analyze those trends and I think AI is helpful. It's going to be able to find the closest shark to the boat, if you will. And what we need to, what we need to mitigate that risk is going to be determined by those computers that are going to grind that data and say, hey, you know what, this is a hot spot. This is a hot topic. You know, approaches going into a certain airport or a certain aircraft has an issue that we've seen that leads to unstable approaches. I think AI is, it's working right now and it's going to become even better, because like I say, we have mountains of data right now coming off of these aircraft. We're data rich and analysis poor. AI is helping us with that. Now, as far as bringing it into the operational side, using it in the flight deck, obviously we were going to have to have some sort of a link between the aircraft and the ground. Equipage comes to mind. Will an aircraft have a link where it can be brought in real live, real time? You know, will it be a required thing? Right now we have airliners that don't have any Internet links or satellite links where they can do that. So I see that as an obstacle.

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### **Captain Steve Jangelis**

Airline pilots support decision support tools. Decision making should be left up to the pilot and that's our concern with a lot of the AI ideas that are out there by folks that are engineering some of that and trying to sell that. We want to make sure that the pilot is always in the loop. We want to make sure that whatever is provided is again a decision support tool rather than a decision-making tool that just does it automatically. Obviously, there are small tasks that AI can do and again, let's take it on a take case by case basis. We're very optimistic. We want to work with vendors like Honeywell and those that are going to develop equipment that can be installed in aircraft. But again, we want to make sure that the most important part is the human is in the loop.

### **Adam Kress**

Yeah, it makes perfect sense. It will be very interesting to see how it all evolves, you know, when it comes to safety and everything beyond. Sure. Well, I want to thank you both for joining me on the podcast today. It's been a wide-ranging conversation on safety, which is always interesting.

I've never failed to be impressed with aviation's obsession with safety and you know, despite the occasional mishaps, it remains overwhelmingly the safest form of mass travel for people and I think we should be proud of that.

I have one last question for each of you. We call the podcast Aerospace Unplugged. So when you guys unplug and you're not thinking about aviation and aviation safety, Thea, maybe we'll start with you. What do you like to do when you unplug?

### **Thea Feyereisen**

Well, right now I am planning my summer trip to Alaska. My sister lives off the grid there. I'm excited to reel in some King salmon. Might also go do a little halibut fishing. You know, my daughter is a fish biologist, I'm bringing her with me when I'm not planning my next vacation. I'm studying up on the ancient gar fish, which is her area of specialty. 150-million-year-old fish, so trying to get a little bit smarter about fish biology so I have something to talk to my daughter about.

### **Adam Kress**

No, that's great. Thea and I have talked about this plenty in the past. My sons both love

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fishing and now that maybe we know someone in Alaska, I don't know you may have some company. But Steve, how about you? When you unplug, what do you like to do?

### **Captain Steve Jangelis**

Well, Adam, if you come down to the Port Canaveral area, I'll be happy to take you out on my boat and do some fishing. That's some of my some of my time off. But one thing my wife and I take big pride in is we're assisting a local rescue. We foster pregnant pit bulls, and raise those puppies up and then adopt them out. And we've been successful many times. We have a couple foster fails, if you will. A couple puppies that we've raised are now in the house. We're empty nests, so they are a bulk of our time and my wife being a flight attendant, me being a pilot, you know, we're on the road, but we make it work and we're glad to help the community out and that's a big love of ours.

### **Adam Kress**

Fantastic. Well, thank you again both for joining us on Aerospace Unplugged and thanks again to all the listeners out there. We'll catch you again on the next episode of Aerospace Unplugged.