

EPISODE 30

[INTRODUCTION]

[0:00:05.5] IP: On this episode of AvTalk, we take an in-depth look at Southwest flight 1380, including some of the media coverage after the incident, and we talk to John Ostrower about the new emergency airworthiness directive requiring inspections of the CFM56-7B engine. We also see how engine issues are affecting the 787-9 and we try the best Airbus and rebranding of the C-series.

[INTERVIEW]

[0:00:29.9] IP: Hello and welcome to episode 30 of AvTalk. I am Ian Petchenik, here once again with —

[0:00:40.4] JR: Jason Rabinowitz. Hello. You thought you could get rid of me.

[0:00:43.1] IP: Welcome back. I really tried.

[0:00:46.3] JR: You tried, but I actually listened to the episode.

[0:00:48.4] IP: You've made it back to Germany.

[0:00:50.2] JR: Yeah.

[0:00:50.7] IP: This is the first. It took 29 episodes to get you listen to the episode. I'm impressed and I'm proud of you and I think you're doing a great job.

[0:00:58.8] JR: I had to hear if it was any good without me, and it was pretty okay.

[0:01:02.7] IP: Pretty okay is what we aim for here.

[0:01:04.7] JR: Yeah, at least we strive for pretty okay around here.

[0:01:07.5] IP: Yeah, and it takes us a long time to get there. But you made it back from Germany.

[0:01:11.7] JR: I'm back. I flew a Virgin Atlantic back. It was fun.

[0:01:16.1] IP: We heard from you — Was there anything after we talked to you that was worth mentioning? We heard about sleeping in cargo compartments and warm cookies and chilled champagne and a little bit about some standing seats that we'll hopefully never again see the light of day. Was there anything else?

[0:01:31.5] JR: No. That's the bulk of it, but the stupid standing seats have been in the news all over in the last week. Let me just emphatically say, you will not be sitting on those seats now or ever in the near future. They are not happening. Stop writing about it. It's not a thing. Thank you.

[0:01:50.9] IP: All right. A public service announcement from Jason Robinowitz.

[0:01:54.0] JR: The more you know —

[0:01:55.2] IP: We'll have to get a gif from that for the show notes.

[0:01:56.4] JR: I mean, the damn thing is trending number 2 on the homepage of Reddit right now. It's ridiculous.

[0:02:02.5] IP: I feel like that happens every time somebody comes up with something ridiculous for an airplane.

[0:02:06.5] JR: Yeah, it happened 10 years ago. The last time they trotted that thing out in front of the public, and look where we are now.

[0:02:11.5] IP: Well, yeah. I mean — Yeah. Let's talk about the major event in aviation in the past two weeks. Since we last had a show up, is the Southwest flight 1380 departing New York

and on its way to Dallas. Experienced an uncontained engine failure near Eastern Pennsylvania and diverted to Philadelphia. Tragically, the failure of the engine shed debris and punctured the fuselage and a woman was killed, which makes it that the first fatal to a passenger aviation accident since 2009 in the United States.

[0:02:54.8] JR: In the US, yeah.

[0:02:55.9] IP: In the US. Yeah, not overall.

[0:02:57.8] JR: Yeah, and there's a few caveats, but it was a very, very long streak of safe flying in the US and really everywhere else in the world for a good stretch too, but this one was particularly sad because it was just a freak accident that you would never have thought could happen.

[0:03:15.5] IP: Yeah. I mean, it's a real shock, and I know that listening to the air traffic control audio, you can hear kind of the calm, but there's like a shock there. There's a part of the engine missing or the part of the plane missing.

[0:03:29.9] JR: Part of the plane is missing. Yeah, not the engine.

[0:03:31.7] IP: Not the engine, so it's rather — I'm going to call it shocking to listen to that and to see the photos afterwards.

[0:03:38.8] JR: I mean, when you see the media reports at first that a window was knocked out and a passenger was sucked out or whatever. You think that has to be nonsense. That just simply can't happen, and it very nearly did happen.

[0:03:50.6] IP: Yeah. So there's been a lot of discussion about not only the actual incident that occurred in the engine, and we're actually going to have John Ostrower join us at a bit to talk about the specifics of the CFM56 engine. What actually occurred in there and the airworthiness directive that has since been issued to investigate that and mitigate the potential for future reoccurrence. We'll talk to him in a little bit.

But, I mean, there's also been a lot about what happened inside the cabin, and I feel like a lot of this incident has kind of opened the door for a lot of things where people who are very, very unfamiliar with aviation specific things have jumped in because there was photographs and videos from inside the cabin. Specifically I'm talking about the oxygen mask debate that has kind of come up and how people are now discussing the shape of the oxygen mask and things like that.

Jason, I don't know where you fall in on this, but I'm kind of on the opinion that I feel like that's a tangential discussion that I don't really feel is necessary right now, if that makes any sense.

[0:05:05.7] JR: Yeah, it does make sense to me. No matter what the safety briefing is, no matter what you tell people, they're always going to do whatever the hell they want to do. They can pay attention. They cannot pay attention. They can read the instructions or not. What it comes down to, if the device you're using isn't intuitive, it's not going to be used right. Basically it's just a little cylindrical round thing that you put on your face and it just simply doesn't look like it should go over your nose. So I've read a few pieces about this since the incident and they want to make it dead simple. It should be shaped like it goes over your nose. To me, it's that simple.

[0:05:43.1] IP: Well, I feel like it's not that simple, because what we're talking about is something that's designed to also be used in complete darkness when people don't know which way is up. So the design of it becomes circular so that it doesn't matter which way you put it on. The silicon wraps to your face.

[0:06:01.7] JR: Yeah. Well, like I said, it's human behavior. They're going to do whatever they want. They're going to panic. They're not going to listen to the briefing, unless you engineer around it. There's really nothing you can do to get a person to properly use something that they've never in their life used before and never thought they were going to use.

[0:06:19.4] IP: And will likely never ever use again. I mean, yeah. I think that's one thing, but the other thing is nobody was treated for hypoxia to my knowledge. It obviously worked.

[0:06:30.8] JR: Right. If they're breathing through their mouth, it's going to work, or the aircraft descended quickly enough where they needed them in the first place.

[0:06:39.5] IP: Well, I mean, there's also that part of it, is they initiated the emergency very quickly and then got down below the level where the usable oxygen becomes — Or increases. You're not as worried about hypoxia as you were. I mean, I think that's become one of the things, and then there was also perhaps the worst piece of journalism to come out of this particular accident, was I think it was a marketplace article about how can you tell how old your plane is.

[0:07:08.7] JR: Let's just set the record straight on that. Now, not that it needs to be. It does not matter how old your aircraft is pretty much ever, unless you're flying like a rickety DC3 in the jungle, and even then it doesn't matter. The age of the aircraft nearly never matters when it comes to safety.

[0:07:27.2] IP: Yeah, it was one of those things that I've read the article and I kept waiting for the kind of like — The question was asked so that the rumor could be dispelled, but it wasn't. There was actually buy-in to that question, and I'm sitting here thinking about how many planes I've been on that are really old and I've flown them because they are really old.

[0:07:49.8] JR: I go out of my way for old planes these days. They're more comfortable.

[0:07:52.9] IP: Well, there's that too, but not even that. I'm talking about like really old stuff, and like jumping in a chance to fly in a DC3, because I know that that's going to be well-maintained.

[0:08:03.5] JR: Right. I mean, a couple of years ago, maybe two years ago, I went out to Hamburg, Germany to fly Lufthansa's JU52, and that thing is ancient and was later grounded due to metal fatigue, which I didn't know at the time. But at the time, it was very safe.

[0:08:20.9] IP: But, I mean, that's the thing. When those issues are discovered, the airplanes stops flying. But age doesn't matter, and it's also the fact that you can replace engines on an aircraft.

[0:08:30.3] JR: Right. You could have — What? A 20-year-old aircraft with a brand new day-old engine?

[0:08:34.8] IP: Exactly. So I thought that piece was very, very ignorant. But also a bit disingenuous, because it felt like they were not writing to say aircraft age isn't really a factor. It's just something that exists. There are the—

[0:08:51.7] JR: They're just posing the question, "Is it safe?" I don't know. Maybe? Maybe not?

[0:08:55.8] IP: Yeah. It's just very upsetting to read, because I felt there was no kind of curiosity on the part of the writer to figure out if that was an actual question that one should be asking.

[0:09:06.7] JR: All I'm going to say is I feel much feel safer on a 35-year-old Delta 757 than I do on a 0-year-old aircraft in other parts of the world.

[0:09:20.9] IP: I think that's a fair statement.

[0:09:24.3] JR: Not the whole world, but there are places where maintenance just isn't up to the standards of the rest of the world, and we know here, at least in first-world countries, like the US, everything is hopefully really scrutinized and standardized to the point where it doesn't matter if the aircraft is 30+ plus years old.

[0:09:43.8] IP: So let's talk about what actually happened on 1380 so that we can then bring John in to talk about what is happening to make sure it doesn't happen again. They were in flight passing through about 3,200 feet and —

[0:09:58.0] JR: Out of La Guardia.

[0:09:59.1] IP: Out of La Guardia, on their way to Dallas, and one of the fan blades — So the fan that's at the front of the engine, one of the fan blades there basically cracked off at the base. When you've got something spinning as fast a jet engine, that sheds a lot of energy. So it was — We can talk about the kind of like testing and things like that with John, what will happen to make sure that those don't have any cracks and/or anything like that. But one of the fan blades

had a crack in it, and the NTSB said that the crack was not visible to a visual inspection. It wasn't something that was like, "Oh, look. There's a crack," but it would require a specialized inspection. It cracked and it caused significant damage to the engine and which then shed debris into the fuselage, the wing and broke the window.

[0:10:53.5] JR: None of which is supposed to happen.

[0:10:56.4] IP: Right. That's what happened to the engine. They landed the plane safely, and this was another thing that has bugged me about this whole discussion. The talk of the pilot.

[0:11:07.8] JR: Pilots.

[0:11:09.2] IP: But the talk has been pilot, and I feel like there's always this misunderstand — And I don't know how far this goes back in kind of popular media, but there's always a discussion of the pilot and the copilot, and I feel like because there's such ignorance about how a flight crew actually operates and what the job of the flight crew is versus the pilot flying, the pilot not flying and all of the work that they're doing, that I find it always very difficult to separate out the flight — One pilot from the other unless we're talking about the pilot has become incapacitated, and so the other — Those kinds of stories.

But I feel like the crew resource management and the team work that the flight crew did to get the plane safely on the ground as quickly as they did was — I mean, we're talking about heroes and things like that. I'm willing to go out and say that they are.

[0:12:02.2] JR: Yeah, absolutely.

[0:12:02.6] IP: I mean, because after seeing photos on the ground and what the actual damage was, but they don't know that. I mean, the first important was an engine fire and then after kind of assessing situations, getting a little bit more information from the cabin crew said, "Well, the plane is not on fire, but there's a piece missing."

[0:12:20.6] JR: And a hole in the fuselage.

[0:12:23.2] IP: Right. So dealing with all of that, quickly donning an oxygen mask, coordinating with air traffic control, getting the plane safely on the ground.

[0:12:31.6] JR: And it wasn't just dealing with an engine out. The NTSB said there was a 40 something degree un-commanded bank when that engine went out. That's significant.

[0:12:42.0] IP: Yeah, because basically the right engine's operating just fine. The left engine all of a sudden stops operating and becomes this huge piece of draggy material. So you had 41.3 degrees un-commanded left bank. I mean, the maximum normal turn that you're ever going to experience in an aircraft is — What? 20 to 25 degrees.

[0:13:03.5] JR: 20 something. Yeah.

[0:13:05.0] IP: So that's a hell of a bank.

[0:13:08.0] JR: Yeah. To say they just basically ran checklists or whatever. It's ridiculous.

[0:13:13.5] IP: So I think that I'm willing to go out and say heroes all around, a fantastic job by the air crew, and they landed safely in Philadelphia. One of the things that they did was that they took an extended final approach and landed, they said, flaps 5, and I think it was the normal flaps configuration and hopefully there's a 737 pilot out here who can email us at podcast@fr24.com if I am wrong, that it's flaps 35 or flaps 40. So they landed quickly, because they didn't know if the airplane was going to be controllable with an increased amount of flaps.

I mean, just an amazing amount of work, the workload that goes into this. All that said, this is the thing that a flight crew is trained for.

[0:14:01.7] JR: And hopefully never use.

[0:14:02.3] IP: And hopefully have to use.

[0:14:04.1] JR: This is why they get paid. This is why they get paid the big bucks, is to control unplanned incidents of this nature.

[0:14:12.2] IP: So we're going to take a very short break and bring in John Ostrower and talk about the aftermath of this as far as what the FAA and other global regulatory agencies are looking at, because this engine is on thousands of aircraft around the world. It's not just a US issue. It's a global issue, and to see what CFM, the manufacturer is doing, what the FAA has mandated that's kind of spreading out from there and what the airlines are doing to make sure this isn't a problem that repeats itself. So we'll be back in just a moment with John Ostrower.

[0:14:56.1] IP: And we are back with John Ostrower, aerospace journalist extraordinaire who we've asked to come and talk about the after effects of Southwest flight 1380 and what's happening at the regulatory level beyond just the accident investigation, but what's going on with the recent federal aviation airworthiness directive regarding the CFM engines and other issues surrounding that. John, welcome back to the program.

[0:15:25.5] JO: Thank you for having me.

[0:15:24.6] JR: Welcome back, John.

[0:15:25.8] JO: Thanks. Thank you.

[0:15:27.3] IP: John, let's start with the very basics, because a lot of our audience is not extremely well-versed in the lingo of aviation. So let's start with the very basic question of what is an airworthiness directive.

[0:15:39.1] JO: So an airworthiness directive is the process by which the FAA goes out and says that airlines and manufacturers need to do something, specifically it typically applies to operators of aircraft. In this particular case, there was an airworthiness directive that was floating around and in the rule making commentary process prior to last week's accident in Philadelphia and talked about the necessity for repetitive inspections roughly every 1,500 cycles since the last shop visit for CFM56-7B fan blades. The 7B is specifically for the 737NG. Every 737NG since 1997 has had a 7B engine. So it gives you a sense of how large the population of CFM56 engines for the 737 really is in this case. I mean, there are 14,000 of these things out there.

But for the sake of the regulatory side of this, EAD effectively establishes what operators are required to do. In this particularly case we saw — Oh, sorry. Go ahead.

[0:16:49.2] IP: I was going to say this is legally required. We're not saying that the FAA is suggesting something happening here. We're saying this is — If you are legally operating in — The FAA is saying it, in the United States or a US carrier, you are legally obligated to do whatever we are saying to do.

[0:17:06.5] JO: This has the force of law. Yes.

[0:17:08.6] IP: Okay.

[0:17:09.4] JR: How does it apply overseas if you're an airline in Central Europe and you'll never get anywhere near even North America. Does this apply to you?

[0:17:18.1] JO: So, typically what happens in situations like this, you'd get initial recommendations from the operator also, or the manufacturer. So you'll get a service bulletin which oftentimes covers a lot of the inspection requirements for the entire population, because obviously the FAA doesn't have jurisdiction over airlines operating in, say, Europe, Latin America, so on and so forth.

Effectively, any regulatory action needs to be replicated by the local regulator. In this particular case, it's the ASA, and they will mirror this for operators in Europe and, really, operators all over the world have essentially reciprocal regulatory bodies in many cases that will then amplify the requirement if it's adopted for local carriers.

[0:18:06.1] IP: So this particular airworthiness directive effects the CFM56-7B engines, and you mentioned a few moments ago that there was an airworthiness directive in the works, and that was following the 2016 incident which was rather visually similar upon first glance to the recent events in Pennsylvania. Can you talk a little bit about why it took nearly two years for that airworthiness directive to work its way through the regulatory process and the rule making process, but this, the emergency airworthiness directive was issued within less than two weeks?

[0:18:53.5] JO: So the nature of that initial airworthiness directive, the process by which it was being approved and the notice of proposed rulemaking came out, and there was a back and forth between the manufacturer, the airlines and so and so forth about the requirement. It's not that it was being sold, per se. Actually, in fact, in the case of Southwest, they are actually recommending a more aggressive regime of about 3,000 cycle repetitive inspections which they say actually went significantly farther than they initially did.

A lot of the reason that was moving slowly, at least from what I've been able to glean, is that the service bulletin that CFM had put out prior to the publication of the proposed AD was effectively covering it, was getting it — And by the end of this year actually would have gotten to the heart of covering all the affected engine population and we actually read in a story, I believe, just the last day or so from Bloomberg that the engine that was on flight 1380 actually would not have been covered under the 15,000-hour regime and the original airworthiness directive.

Clearly, there was a necessity to change the inspection regime, change the aggressiveness of the regulatory action to make sure that this happened very, very, very quickly. The uncomfortable part of all these and the tragic part of all these is in larger respect, the FAA and government regulators have earned a reputation for acting with speed and aggressiveness typically only in the wake of an accident rather than in advance of avoiding one, because there are all kinds of — There is business politics that are at play here.

So there were folks who were derisively calling the FAA the tombstone agency, because the criticism was that the FAA was only acting as a result of what had happened rather than get ahead of this after — Again, you see an incident that is virtually identical and it kind of comes back to the damage pattern of the engine and what the fragments coming off of the engine did the airframe. Obviously, on the case of 1380, the cowling and the inlet structure came off, struck a — Leading into the wing and struck the fuselage and ultimately caused the depressurization of the plane and tragically the fatality of the woman sitting in the window seat. There is this sort of additional catalyst that comes with a tragedy, and unfortunately the pattern has repeated itself in that regard.

[0:21:34.2] IP: So we now have the emergency airworthiness directive, and I was wondering if you could walk us through — As Jason and I talked about before the actual event that occurred, and so the issue was with one of the fan blades, and so I was hoping that you could about what the actual AD is specifying airlines and other operators do to make sure that the engines are safe to operate.

[0:22:00.5] JO: So the emergency AD first and foremost says, “Within 20 days, requiring a one-time ultrasonic inspection on all 24 of the fan blades on a CFM56-7B engine that have accumulated more than 30,000 flight cycles. So that a flight cycle is a startup, a takeoff, a landing and a shutdown. That’s considered one flight cycle. Again, you get the highest power stress on the engine.

Again, 30,000 cycles is a lot of cycles. When you — That starts off with hundreds of airplanes that need to be inspected as a result of that. In conjunction with that, CFM actually put out its own updated service bulletin which talked about — Potentially, it’s an inspection regime that’s identical as far as the ultrasonic inspection by the end of August for fan blades with 20,000 cycles and inspections for all other fan blades when they reach 20,000 cycles. It covers the spread prior to the 30,000 cycle kind of marker that the FAA has put down. On top of that, after the first inspection, then they’re telling your alliance to repeat the process every 3,000 cycles. So that’s about every two years or so.

[0:23:17.5] IP: So when we say ultrasonic inspection, I assume we’re not talking about walking around with like the ultrasound machine you see in a hospital.

[0:23:24.4] JO: You know, that’s a really good question, and I will claim ignorance on the precise amount of sort of equipment required to examine each blade, but it’s certainly something that it is a very hand-on process. I do know that. But it can be done in — I understand, about 3 to 5 hours per airplane roughly.

[0:23:45.5] JR: Well, we know it’s not a visual inspection, because the NTSB very clearly and quickly said that the crack in the fan blade was on the inside of the blade. So simply looking at it doesn’t do anything. They have to do these pretty lengthy and detailed inspections electronically or, like you said, however it is they actually do do it.

[0:24:04.6] JO: Absolutely. I mean, it's going to be a time-consuming process just to dig in there from a volume perspective. I mean, there are 14,000 CFM56-7B engines in operations. I mean, this is quite literally like saying there is a major safety issue with a Honda Accord or a Toyota Camry. I mean, that's the equivalent here that we're talking about as far as the ubiquity of this product.

[0:24:28.1] JR: Right, and getting all the equal agencies throughout the world; China, Japan and all these European countries, India, all to be on the same page to make sure these inspections happen to me seems like a very daunting process.

[0:24:42.5] JO: And this service bulletin is a great way to get ahead of that in a lot of respects, because if you've got that as sort of a — The unifying force here is the manufacturer, CFM. They're able to issue recommendations directly to operators, and certainly things move at the speed of regulation more often than not. So it allows for kind of a fast lane, so to speak, of getting things moving.

[0:25:08.6] IP: John, you mentioned the ubiquity of the CMF56. I mean, thousands of engines. So I guess my question is why have we seen nearly identical. If there are so many engines, why we see nearly identical events with just Southwest? I mean, is there something different about their operations or is it just the number of planes they have that changes that calculus and kind of puts them in a greater likelihood to experience something like this?

[0:25:33.4] JO: I think this is the peril of fleet leadership. This is an airline that not only assumes their responsibility for working the kinks out of a new model. So they launched the 737NG in the 90s and then they just took the first 737 Max last summer and their launch customer, launch operator responsibility is finding those problems early on. But the flipside of that, which I think is less discussed, is you also find all of the problems with the airplane that will develop over the long term use of that airplane. You get it on the backend too.

So you take that, you take the aggressiveness of Southwest operations. I mean, they are flying the hell out of these airplanes. I mean, Southwest, known for their fast taxies and quick turns and it's more five flights a day. I mean, there was some — Looking at the airplane that was

involved in 1380, I mean, it was doing a times 7, 8, 9 cycles in the six months — Nine cycles daily, in time leading up to the accident. So these are airplanes that are pushed really, really hard. It's not to say that there's anything — I mean, it ultimately requires a certain level of care that Southwest and Boeing as kind of a symbiotic relationship have crafted over the years. A lot of the reasons that the 737 is as efficient in terms of operations and reliable in terms of operations as it is, is because Southwest finds the boundaries, and they are able to effectively say, "We have done this. We have shown this. We have demonstrated this by virtue of the law of large numbers," that you've got this tremendous 737 operation that is, again, the largest domestic airline in the United States flying — Again, flying the hell out of these 737s and pushing the boundaries of their operational capability.

Look, we also saw this on the 300s too. If you recall, there were twin incidents also with skin cracking and inflight depressurizations on the 300s and the 2000s that required a total rework, effectively, new skin panels on a huge portion of a 737 classic fleet that was flying with Southwest. Again, because they got to this point in their operations where they were seeing fatigue cracks that Boeing wasn't even expecting.

So it really is, again, the risk and peril of being, number one, a single fleet operator. Because, again, if one thing happens to one type of airplane and all of a sudden 500 of those airplanes are affected in your fleet, that presents a significant risk to your operations.

I mean, again, on top of that, you also got to acknowledge risk of being on the frontlines of this. It really is a fascinating study in not only the capabilities of how you make an airplane reliable over a long term, but what happens when you just have volume metrically more operations and more data to play with as far as proving what is and isn't reliable when you were flying a 737 around the country.

[0:28:57.3] IP: So if we're looking at operators that are single fleet or are single type in their fleet or doing a massive number of aircraft, we're talking about Ryanair, we're talking about easyJet with Airbus aircraft and we're looking at maybe — I mean, Lion Air is got to have at least a billion 737s on order right now. I mean, is there something specific to the way Southwest operates that makes it more likely versus a Ryanair which has, I mean, not an insignificant number of 737s in their fleet.

[0:29:32.2] JO: Yeah, Ryanair has north of 400. It's a huge, huge, huge fleet. The difference is that it's actually a really young fleet. The key to understanding Ryanair's operations versus Southwest — I mean, Ryanair was post as well, it's the Southwest of Europe. I mean, granted there were divergences in the business model around no frills and that side of things, but fundamentally it was leveraging the same idea. It's like single fleet, quick turns, rapid operations.

But Ryanair doesn't hold on to its airplanes as long as Southwest does. I mean, the number of airplanes that are leased is significantly greater and they will then either resell those airplanes after 8, 12 years to other operators. And those airplanes have a very long secondary life, and heck, it's not a bad way to make a dime when you think about the pipeline of reselling a used but well-taken care off 737 to a secondary market operator.

[0:30:34.2] IP: So I want to switch gears and talk about the actual incident or twin incidents, really, if we're now safely, I think, tying the two together somewhat, and that's the design aspect of the engine itself. I mean, one of the design criteria for an engine is to contain a failure of the engine itself. I mean, when we talk about these types of events, we keep talking about an uncontained engine failure, because parts of the engine were not contained and they impacted the fuselage, they impacted the wings. In this case, created a tragic incident where a person was killed because of the debris.

So is there something being looked at? Is there a redesign or is there just another round of revision to look at why were these failures not contained?

[0:31:27.9] JO: So it's interesting. I mean, calling this an uncontained engine failure, I think, it fits the definition. One of the important things when you talk about uncontained engine failure is that whether or not the fan blade actually exited the fan casing. In this particular case, it actually didn't. The fan casing did its job. The regulatory requirement is that if you lose a blade — And there are very, very, very dramatic videos of this both in full motion and unbelievable slow motion on YouTube that you can spend plenty of time pouring over, but that show that the blade, the explosive release of the blade, which is how they test it on the ground, has to be fully contained within the casing and not cause damage to — cause damage to the aircraft or cause the engine to come off.

In this particular case in Southwest, there certainly was a blade failure, but the blade itself was contained. The question then becomes, and this is a secondary requirement, is what happens to the nacelle once that failure happens? We see a similar damage pattern between what happened in August 2016 and what happened on 1380. So within that, the nacelle requirement is not that it has to survive a containment. It's really a question of when the engine is unbalanced like this, because it causes tremendous vibrations and shakes like crazy and it's just a very disgusting, destructive force that happens here, the transfer load of all that vibration cannot cause secondary damage. Effectively, the nacelle has to be able to survive the aerodynamic changes in the configuration, which is another way of saying; if part of the engine blows apart, a rushing 500-mile per hour wind can rip the nacelle or front of the nacelle off either and transferring all of the energy in the engine to the nacelle in the front of the engine can't cause damage to the airplane.

In this case and in August of 2016, that happened. The NTSB said explicitly that they found blue paint on the leading edge of the wing and the NTSB told me directly that this is something that they're looking at. The structure of the nacelle is something that they're going to look closely at in terms of its effect on the performance of the aircraft, on causing the depressurization, causing the damage to the leading edge of the wing in the case of the Southwest. Incident from 2016, also caused significant damage to the fuselage and leading edge of the horizontal stabilizer. You've now seen two near identical incidents that caused significant damage to the airplane.

That, from an operator perspective, if you're operating a large fleet of 737s or any with 737s, that becomes an almost more important requirement. Once you get past the initial requirement for inspections and making sure that the blades you have are safe, there's almost certainly going to be a conversation that goes on in this industry over the next year or less around the ability for a nacelle to withstand a change in aerodynamic load and change in imbalance and what it does to the aircraft if this happens. So the regulatory requirement is fairly explicit about what is and isn't supposed to happen to an engine nacelle.

Like I said, there are 14,000 of these out there. Every CFM56-7B engine, there are two on every airplane and there are two nacelles to go with each of these. So if there are design changes or corrective action required or recommendations made by the NTSB, that becomes an expensive,

massively — Potentially significantly disruptive process of either replacing those or figuring out a way to mitigate the risk on those. What that will be is very much yet to be decided, but it is absolutely going to be a discussion that's going to take place over the next months and years.

[0:35:40.6] IP: And we will certainly continue to follow this very closely. I mean, if nothing else because the 737 is so — I mean, just a massive part of worldwide fleets. Like you said, if there are changes to the airframe or the power plane, it has a potential to be quite disruptive.

John, I want to thank you so much for talking with us again and kind of giving a lot of context to what we've been seeing in both the aviation press but also in the general media, which I think often lacks context. So I'm glad you were here to give some.

Thanks again for joining us.

[0:36:15.0] JO: My pleasure. Thanks for having me, guys.

[0:36:24.0] IP: So let's transition gears from one engine issue to another.

[0:36:29.0] JR: Another big one.

[0:36:29.8] IP: Literally, a big engine. Rolls Royce has having issues with the Trent 1000th, which powers these 787-9s. Jason, you've kind of been a little more involved in this than I have. So I'll let you kind of explain this situation and how it's effecting some airlines.

[0:36:49.5] JR: Well, basically there's — Do I call it a defect in these engines or unexpected maintenance requirements earlier than planned? I won't get in the technical details, because I'm not totally well-versed in it, but basically there's something going on with these Rolls Royce Trent 1000 engines in this 787-9 and it's wreaking havoc with a few airlines long haul fleets, specifically British Airways, Air New Zealand, Latam and Norwegian have been hit pretty hard because it's a significant chunk of their fleets, and New Zealand specifically has been the most impacted. They've had to fuel stops along the way in their long haul routes, because it turns out New Zealand is really quite far away from their destinations, and a lot of these airlines have also had to lease equipment.

So Air New Zealand is leasing high-fly A330s and A340s, which is super unfortunate if you're one of their passengers, because those things suck. Latam has leased Wamos Air A330s. Norwegian is simply Norwegian. They have issues that predate the Rolls Royce Trent 1000 issues, but this doesn't help. It's rumored in, that you might like this, that BA might be un-retiring a few 747s.

[0:38:14.2] IP: Really?

[0:38:15.3] JR: Really. They've retired a bunch of 747-400s over the past couple of years that was kind of hanging out in the desert and it turns out they may reactive a few of them, just like Delta did when they were ramping on their 747s operations when one of them got hammered by hail out in China, I think.

[0:38:34.2] IP: Yeah. They were flying through China and it looked like somebody had turned the airplane into a golf ball.

[0:38:39.7] JR: They just retired the damn thing. In this BA is rumored to un-retire a few 747s to fill the gap. So the industry is adapting. They're doing the best they can to plug these gaps that the 789 is leaving, but if you're booked on Air New Zealand, Latam, BA or Norwegian, you might feel the pinch of these grounded aircraft that have been grounded, in some cases, for months already.

[0:39:05.3] IP: Wasn't Virgin Atlantic also affected?

[0:39:07.7] JR: Ah! That's right. I forgot about Virgin Atlantic had to reactivate an also retired A340-600. So we forget about them. So it's annoyingly widespread. They've also acquired a few of the Air Berlin A330s.

[0:39:23.0] IP: Yeah, they put a few of those into service now already. So I know that the A340-600 was supposed to be kind of an aircraft last resort for them, but it seems like it's gotten a lot of use.

[0:39:35.0] JR: Yeah. Virgin had told me that it's a spare aircraft. It will be used when necessary to fill in gaps in the schedule. It also happens to be their sole aircraft without Wi-Fi, which is a thing I track as a part of my day job. But the damn thing is in service every single at this point and are nearly every single day. It's very much completely back in the fleet.

[0:39:55.5] IP: Well, then another engine issue that I'm sure we will hear more about later as things ramp down as far as the inspections and things like that go and operations return to normal hopefully sooner rather than later.

Shall we talk about a little bit of good news?

[0:40:12.0] JR: I like good news.

[0:40:13.0] IP: And let's say your favorite airline put the Embraer E190-E2 into service just yesterday.

[0:40:20.3] JR: I'm not allowed to say the name of the airline, because apparently I don't know how to say it.

[0:40:25.1] IP: We've received a number of emails about your mispronunciation of the airline. We had been saying — I believe we'd been saying — How are we saying? Wideroe?

[0:40:33.1] JR: I'm not allowed to say it.

[0:40:34.6] IP: Which is incorrect, and I will do my best and say Wideroe, but that's probably also incorrect, but I believe it's closer. But the E190-E2 is in service and doing a lovely job flying over some mountainous terrain and lots of pretty pictures in the snowcapped mountains and things like that. That has happened. I just wanted to try and get you to say the name, but —

[0:40:57.9] JR: No. Not happening. You're not going to trick me this time.

[0:41:00.7] IP: All right. Other good news? The A350-ULR. Good news depends, I guess, how you feel about spending 20 hours on a plane. But the A350-ULR made its first flight this week.

Will go to Singapore the second half, Singapore Airlines' second half of 2018, and that will be the aircraft that allows them to possibly restart Singapore-New York routes. 20 hours in the air. I don't know.

[0:41:27.4] JR: Yeah, we'll see. We don't know what the interior is going to be like. If they're going to have economy, premium-economy, business first. We don't even know what airport it's coming back to. The old A34500 flight went to Newark, while the current A380 service goes to JFK. We don't know if they're going to Newark and JFK. It's oddly contentious thing. We don't know which one they're going to go to, but I want to know. But it's a long flight. I don't know. That's my only answer for that one.

[0:41:57.6] IP: Yeah. We'll find out when and if they re-launch and whether or not we decide to try and do — I think that would be an interesting way to record a podcast. We could do a 20-hour episode of the podcast. Just see what happens.

[0:42:10.0] JR: I think we should talk to someone from Singapore [inaudible 0:42:11.6]. See if they want to talk about it.

[0:42:12.8] IP: All right. Let's do it. Boeing had their earnings call today, and one of the interesting pieces of information that came out was that Iran Air has deferred their 777-300ER deliveries until — Was it 2019?

[0:42:28.9] JR: Yeah, next year, the earliest.

[0:42:32.1] IP: So if they ever take them at all, it sounds like.

[0:42:34.6] JR: I mean, they want them, but at this point it seems like they can't have them. I don't know. Political crap, I don't want to talk about too much. But it's kind of disappointing. They need it.

[0:42:44.9] IP: I mean, they're still taking deliveries to their new Airbus aircraft. Hopefully, it all works out.

[0:42:51.0] JR: I mean, their fleet plan kind of seem preposterous. Anyway, the odds that they actually take a fleet of A380s to me seems ridiculous, but more power to them if they actually do.

[0:43:00.5] IP: I think — Yeah, I don't think we'll see that. At this point, I'm surprised when anybody says anything about the A380 other than Emirates.

[0:43:08.1] JR: Just today, we saw the configuration and paint jobs for the ANA A380s, which I actually I forgot to talk about this. I took a tour of the Airbus Hamburg facility after ALEX last week and we saw pieces of it in the facility actually being bolted together, which is pretty cool.

[0:43:27.5] IP: All right then. Things are coming together.

[0:43:30.4] JR: If you're ever in Hamburg, take the Airbus tour, because they walk on you the production line and you're like two inches away from the aircraft. It's really cool.

[0:43:37.9] IP: That sounds like a nice tour.

[0:43:39.4] JR: Yeah, we should have talked about that. Oh, well.

[0:43:40.2] IP: Well, we just did.

[0:43:42.5] JR: There you go.

[0:43:43.0] IP: All right. Shall we discuss another — This is an airline that is trying to do something, but has not quite done it.

[0:43:49.3] JR: They're so close.

[0:43:49.8] IP: Air Belgium.

[0:43:50.7] JR: They're so close. Air Belgium is this funky little upstart in Belgium, of all places, that's trying to restart services or startup services out of Belgium using X-FinAir A330-300s,

which is — Whatever. I have many opinions on that, but they were supposed to start service I think like next week and they had to postpone a full month because of two reasons. One, they said, “We are not available in the GDS,” which is like Sabre and all the places where travel agents book tickets. So it turns out no one could actually book our flights at this point, which is a bit of a problem. You don’t want to operate airplanes that don’t have people in them.

The second is they never got to the point where they were able to get over flight permits for Russia, and when their routes are Europe down to Asia, you need to go through Russia. So rerouting around it would be extremely expensive. So they’ve had to postpone service for a full month.

[0:44:52.3] IP: So I guess we’ll keep an eye on Air Belgium.

[0:44:55.9] JR: If there’s an Air Belgium left to keep an eye on.

[0:44:57.6] IP: That’s the other thing. Hopefully they don’t stop before they even start.

[0:45:01.4] JR: Yeah, I usually don’t pay too much attention to airlines startups, because so often it ends up not starting up, but they seem so close at this point. They have the crew, the airplane, livery, everything.

[0:45:12.3] IP: They actually operated — I don’t know if they were [inaudible 0:45:14.6] leases, but they were operating for — Was it Air [inaudible 0:45:17.6]?

[0:45:18.7] JR: Something like that. Yeah, something like didn’t require going over Russia, and they operated a mock demo flight the other day for their own service. So they’re close, but Russia is getting in the way.

[0:45:28.9] IP: I feel like we say this a lot. Hopefully it all works out.

[0:45:31.3] JR: Yeah, we’ll see. Tune back in.

[0:45:33.4] IP: Let’s close with a call for some marketing.

[0:45:38.1] JR: We think our listeners can do a better job in what Airbus is doing right now.

[0:45:43.5] IP: So Airbus has — There was a report today. I think it was Bloomberg who came out with it today that said, “Airbus is going to fold the C-series into their marketing catalog and possibly rename the C Series CS100 and CS300 as the Airbus A210 and A230.”

[0:46:04.4] JR: No.

[0:46:05.4] IP: Which I feel like we could do better.

[0:46:09.0] JR: We can do better.

[0:46:09.7] IP: What I would love to have happened is for someone to email us at podcast@fr24.com or send us a note on Twitter @flightradar24 or on Facebook, Flight Radar 24.

[0:46:23.6] JR: Or just shout really loudly, we’ll hear you.

[0:46:25.4] IP: Or just shout really loudly with something better than the Airbus A210 and A230, because I know we can do better than that.

[0:46:35.1] JR: Yeah. No. That’s terrible. Airbus —

[0:46:37.0] IP: Dear listeners, I know we can do better.

[0:46:39.1] JR: Yeah.

[0:46:39.9] IP: We’ll see what ends up happening with that. It sounded — The explanation made sense to me.

[0:46:47.0] JR: Yeah. I mean, you don't want to call it in the A300s series, because it's not really in that family of aircraft, but you don't want to leave this C-series branding around, I guess.

[0:46:58.5] IP: You could still do better. All right. Hopefully we'll get a few good ones and I don't know what we'll do. We'll send a petition to Airbus or something like that. But I know we can do better and I would love to hear what we can come up with. Jason and I are going to think about what we think it should be instead and we'll talk about that in the next episode.

Until then, thank you everyone for listening. I am Ian Petchenik. Here once again as always with

—

[0:47:24.3] JR: Jason Rabinowitz. Good to be back, and thank you for listening.

[END]