

EPISODE 53

[INTRODUCTION]

[00:00:00] IP: On this episode of AvTalk, we are joined by The Air Current editor-in-chief, Jon Ostrower, to discuss the crash of Ethiopian Airlines flight 302 and the subsequent grounding of the 737 MAX aircraft. We also got an update from the NTSB in the crash of Atlas Air flight 3591, and an update on the closure of Pakistan's airspace to most flights.

[INTERVIEW]

[00:00:31] IP: Hello and welcome to Episode 53 of AvTalk. I am Ian Petchenik, here as always with Jason Rabinowitz, and we are joined by The Air Current's editor-in-chief, Jon Ostrower, to discuss the week's events. Jon, thank you so much for joining us again. It's very great to have you and your expertise back on the show.

[00:00:49] JO: Always great to be with you guys, thanks.

[00:00:51] JR: Good to have you back, Jon.

[00:00:52] JO: Thanks. Thanks, Jason.

[00:00:54] IP: So our nearly only story that we're going to talk about this week, and we're going to spend quite a bit of time on it since we do have Jon and we're going to use his historical knowledge and subject matter expertise to really dive into the crash of Ethiopian Airlines flight 302 and the subsequent events that have taken place around the world over the past few days. We're recording this on 13 March in the evening, UTC time, and earlier in the afternoon, U.S. time, the U.S. FAA announced that all 737 MAX operating in the U.S., to and from the U.S., would be grounded. They were the last holdout of the regulators or authorities that still had 737 MAX operators in the air following Canada's announcement earlier in the day. So as it stands now, all MAX, 737 MAX 8 and 9 aircraft around the world, once they land, they are no longer allowed to carry passengers.

[00:00:54] JR: Right, and if you haven't keeping too close tabs on it, it's been quite the whirlwind to get to this point. It started, I believe, several days ago at this point with China being the first major country to ground the 737 MAX aircraft, both the 8 and the 9. From there, it kind of ballooned to a hodgepodge of countries and regulators and airlines independently deciding to ground the MAX 8 and 9 and it finally culminated after a lot of pressure.

Eventually, President Trump himself announced that the U.S. should be grounding the 737 MAX. The FAA said they have some new information obtained from satellite data and investigators on the ground. We don't quite know what that is yet, but the 73 MAX is now effectively ground globally.

[00:02:39] IP: So let's step back to Sunday, the 10th of March, where in Addis Ababa, Ethiopian flight 302 departed for Nairobi and crashed shortly after takeoff. Jon, I want to kind of bring you into the conversation to get your insight and a little bit about what investigators are looking at in that crash and kind of the initial developments there.

[00:03:05] JO: Yeah, absolutely. So when Ethiopian Airlines flight 302 took off, what we know so far is that pilots reported some type of flight control issue. Basically, what that means, we do not know at this point, but the aircraft climbed to about – Check me here guys, but I believe 1,000—1,500 feet above ground level.

Addis Ababa is already very, very high above sea level. It's a notoriously high-altitude airport, a challenging airport to fly in and out for that reason, and the aircraft's apparent loss of control and crashed just 6 minutes after takeoff. So immediately that kicked off a very urgent investigation to understand this event, but whatever possible link there might be to what went on in Indonesia on October 29th with the crash of Lion Air flight 610.

So certainly as you put those both in context, you see two massive aberrations in a year of unprecedented aviation safety, and that is what really was precipitated in the urgency by global regulators by China, by Europe, by all over the world ultimately culminating in Canada and the U.S. earlier Wednesday to make a decision to stand down the fleet and more details scant as they may be at this point have become available.

[00:04:20] IP: So the crash investigation as it stands now, the flight data recorder and the cockpit voice recorder are on their way from Addis to Paris where the French version, basically the NTSB or the UKAAIB will perform the recorder debrief or analysis. They'll be opened in Paris and we'll hopefully know more in the coming days once they reach there. They're on their way there now.

The events of Sunday led quickly to Chinese regulators stopping the domestic fleet. They didn't necessarily outright banned 737 MAX flights in China right away, but they said that the domestic fleet was no longer allowed to operate, and that kind of as Jon, you've mentioned, and Jason, you've mentioned, kind of snowballed from there. In a patch work of airlines and regulators kind of independently, or sometimes jointly deciding that they were going to suspend flights.

Cayman Airways became one of the first, and Comair, Ethiopian Airlines followed soon, grounding their entire fleet. And then national regulators started saying, "We're not going to allow the MAX into our airspace, like Germany, Belgium, Australia and others as well.

[00:05:34] JO: Eventually, E.U. as a whole.

[00:05:36] IP: Right, and then the E.U. issued an emergency airworthiness directive. Today the FAA issued not an airworthiness directive, but an emergency order of prohibition. Jon, I wanted to ask you about this. I'm not familiar with this instrument of regulation.

[00:05:53] JO: I can't say that I am as well. I think it's a rarely used tool, and which I think underscores the seriousness of this situation. Certainly, this has put a halt to the 737 MAX operating in any kind of commercial fashion in U.S. airspace for the time being. I think one of the interesting parts about the order itself – There are actually several interesting parts about the order itself, but one of the very interesting parts was that the order doesn't establish a criteria by which the airplane can actually be ungrounded, which I think is important to keep in mind, because as we get deeper and deeper into this investigation and understand what happened to Ethiopian flight and its potential connection to Lion Air, that as you look at that, there is going to be a regulatory criteria by which you say, "Okay. Well, these airplanes are clear to find again."

If that has not yet been established, a lot of that is sort of the most amorphous part in terms of, “Okay, when the 787 was grounded back in 2013, no one knew how to get the 787 ungrounded. So Boeing went and redesigned the battery containment, the venting system to get the airplane in a certifiable incompliance condition back flying again.”

Right now, with these ongoing investigations, we don’t know what that criteria is going to be. Boeing has a software package that they’re going to be rolling out no later than April to make some changes to the very controversial control, MCAS, at the center of the Lion Air investigation. But beyond that, there needs to be a demonstration to the flying public, to regulators, to airlines, that this airplane is safe and safe to operate in a commercial fashion.

[00:07:36] JR: Yeah, I think this has been a particularly different incident than most in the past where most people don’t have any idea what aircraft they’re flying on, what manufacturer it is. They simply don’t care and they frankly don’t need to know. In this case, now, everybody knows what a 737 MAX is and they’re looking out for it. I think Kayak announced today they’re making a filter just for it on their website to help people avoid it.

I don’t think we’re possibly going to get to the point where it’s like the DC-10 where it will be kind of Boeing never recovers from, because the 737, you can’t stop manufacturing it. It’s the backbone of the aviation industry. Where do we even go from here?

[00:08:18] JO: Well, I think that the other thing we need to keep in mind, and you take the micro context, which is what is on those flight data recorders tells us what happened to Ethiopian flight 302, and then you look at the macro context, and I think this is something that’s really important as the rest of the world was making its decisions around grounding the airplane before the U.S. decided to, that this is an airplane that over four distinct generations and countless small updates has been pushed and pulled under grandfathered certification conditions and extreme cost pressures to deliver more and more and more essentially with less and less and less overtime.

That creates ultimately – Makes the airplane a product of its environment in terms of how the airplane was engineered. And I think that when you look at that macro context, I believe it really does begin to explain why regulators globally were looking at taking the steps they were taking

and effectively saying, “Now waiting for the FAA to make their very micro decision about the micro data when the macro picture is – You take that in the context of a massive aberration in aviation safety in the last 20, 30, 40 years. It did require a swift and decisive stand down of what they could control.”

[00:09:34] IP: So let’s take a walk down memory lane. I think you posted a fantastic article yesterday about how the 73 MAX came to be and what the conditions were that necessitated its engineering and its rollout. Take us a little bit through its history, why it came to be, and basically what role it’s trying to serve.

[00:09:57] JO: Boeing didn’t want to do the 737 MAX. I think that’s really important to remember. I mean, when the time finally came to do it, it was a bitter pill that they had to swallow and said, “Yup, it’s the right decision for right now. We’re going to go with it. We’re going to ride this horse the best we can and they’re going to put on a brave face.” So Boeing changed on a dime.

In 2011, the A320 Neo has just been launched. I believe the official launch of the 320 Neo was I believe December of 2010. So by the time things were ramping up on 320 Neo orders, there’s about 1,000 order lead that Airbus had by the time Boeing actually made their announcement. What forced their announcement was American Airlines in July of 2011 – I was in Dallas when they made the announcement. It was an unbelievable thing. They said, “We’re going to buy 460 Boeing and Airbus airplanes.” That was 260 Airbuses and 200 Boeings, and it was a huge blow and it forced Boeing to win that portion of that deal. They had to offer a re-engined version of the 737, the plans for a new airplane route.

Jim McNerney, CEO at the time, just a few months earlier said, “Yeah, we’re probably going to do a new airplane.” They were not doing their evaluations, but our bias is away from a re-engined airplane. So under those conditions, under the fear of losing market share, the fear of losing American, the fear of losing other airlines who are falling one by one for the A320 Neo that they began this development.

So they made it work as best as they could, and it required design compromises and creative solutions throughout the entire process to deliver a product that did what they said that was

going to do. But when you're dealing with obviously a design that has been – Again, like I said, that pushed and pulled over this period of time, the risk is that you push too hard and you make modifications to an airplane that lead to unintended consequences. I think to some extent what we're seeing very much so with MCAS and its interactions with pilots is that an unintended consequence come to life.

[00:12:02] JR: So those unintended consequences, I think what you're getting at here is that they had to push every larger engines on the 73 which already had somewhat not great ground clearance. So they had to raise up the nose I think 8 inches or so. And those much larger engines actually created their own lift and that is what necessitated the need to have this MCAS system, where it basically is a system that when these huge engines onboard basically create their own lift that makes the nose of the aircraft want to go up, which increases the likelihood of an aerodynamic stall that this system, MCAS, will push the nose back down when it detects that stall, and we're thinking that possibly could be what we're looking at with these two incidents.

[00:12:49] IP: Well, certainly we could say definitively about Lion Air is that the system was malfunctioning. Sorry, I should say the system that fed data to MCAS, it's the angle of attack system which measures the angle of the wing in the air relative to, I guess, the nose of the aircraft for the horizon. Whether or not the flow of air traveling at an appropriate speed to essentially maintain aerodynamic lift, and I'm sure I butchered that description terribly.

[00:13:20] JR: I think – I just want to jump and kind of provide a description, one that everyone can kind of do at home. But when you're driving along, stick your hand out your window and then just kind of straight and level and then move your fingertips up, and that's increasing the angle of attack of your hand and you'll see more lift on your hand, but you get to a certain point where you lose the lift in your hand. Not exactly the same, but it's something everybody can do at home.

[00:13:49] JO: I would say that's actually a perfect illustration of it. People could certainly be able to conceptualize. But yeah, that's exactly it. So the angle of attack sensor tells you how high your – Well, in this particular case, your hand is relative to the flow of air. So if that is feeding bad data to the system and it's saying, "Oh my goodness! You're risking stalling." It's going to activate the MCAS system to give the pilot what is supposed to be a similar type of

handling from the 737 next generation family, is going to force the horizontal stabilizer to trim itself until that nose comes down.

[00:14:24] JR: So the system itself was working properly. It was the hardware that fed fault information to it that failed.

[00:14:32] JO: Precisely. The question obviously on top of that – And this was as Boeing developed what's called a fault tree. Essentially, it's like an if-then statement. So if there's going to be a problem that causes a catastrophic failure, a loss of control or potential loss of the aircraft, that there has to be certain – You understand what that fault tree looks like. So on the one hand, the one branch says, "Okay. Well, erroneous AOA data, angle of attack data, is being fed to MCAS and it's not working." Well, that would necessitate a pilot reaction, and the pilot is trained to recognize a runaway trim situation. Essentially, a failure of the trim system. They know how to deactivate that. That is a memory item. You don't have to run a checklist. That's part of the normal operation, training for the 737. Ultimately, that would stop the behavior of the MCAS system.

And they looked at the probability of those two things happening at the same time, and that was satisfactory to the FAA and it was satisfactory to their own engineers that that would be an acceptable implementation of the MCAS system and how it could potentially fail. The problem is a lot of what we saw with Lion Air was that, immediately, the flight preceding it, that happened. The AOA data was feeding bad data. The crew deactivated it, the automatic trim system.

Then on the next flight, 610, the same thing happened. They didn't. Certainly, there was a lot of big controversy back in October and November about whether or not pilots were aware of the MCAS system. Certainly, those that pointed to pilot error as a reason that exacerbated the failed AOA data. Well, it didn't turn off. It didn't respond to it properly.

Certain, I think as we saw in the preliminary investigation out of Indonesia, that there are these different threads. It's never just one thing in an air accident, whether it's maintenance. The AOA system was faulty itself. The airplane did not have an AOA disagree indicator, which was optional on the 737. The crew was not aware of the MCAS system. The crew may have

mishandled the response of the MCAS system and misreading what was actually going on with the airplane.

So you see all these factors lining up, but then, again, that's what it is. It's these individual factors that it's never just one thing, and you have to address each piece of it in terms of a response to it. Certainly, we don't know yet what definitively happened in Ethiopia, but both of the circumstance would point to a lack of altitude available to recover. Whatever happened, and —

[00:17:14] JR: There are a few things I want to dive into a bit more there. So we do not know that the Ethiopian flight was a result of MCAS. We want to be super clear that it looks similar to Lion Air, but, Jon, correct me if I'm wrong, we do not have any information that definitively points to MCAS as being the culprit.

[00:17:32] JO: We do not, but I will say that, certainly, in the FAA's reaction to grounding the airplane today, here Wednesday, that they said there was new satellite data reviewed overnight that pointed to essentially a potential for a link between these two, that there was data that caused them to activate this grounding order and they aren't just being "data driven" around this that they had the data to make the choice to say, "No, we're standing down the U.S. fleet."

So that's what's going to be unfolding over the next several days, but that indication toward a possible link, certainly, was a big spurt to ultimately grounding the airplane despite the fact that we don't know definitively. But again, you go by what data is available and you inch forward a little by little in terms of the investigation and also in terms of the macro picture around how technology was implemented to make the MAX happen, and here we are.

[00:18:32] IP: What's also very interesting to me in the FAA statement today was the agency made the decision as a result of the data gathering process and new evidence collected at the site and analyzed today. Jon, I was wondering if you might have any idea what that could possibly be. The FAA did not say what new evidence was analyzed today onsite, but that was a very interesting part of the statement to my ears.

[00:18:56] JO: It is interesting, but I have to convince, I don't know and I'm quite curious about it. I think that's something that over the next couple of days we're going to probably get a better sense of that. I think that I'm actually – I just pulled up my notes in front of me and the exact wording from the FAA grounding order was newly refined data from satellite-based tracking of the airplane's flight path indicate some similarities between each 302 and JD-610 accidents that weren't further investigation of the possibly, a shared cause for the two incidents that needs to be better understood and addressed.

So that is a major – When you combine what you just said about evidence found at the site, combine satellite that was reviewed and refined in the last day or so as it's become available, what you see is this inch forward that, again, has escalated this to a truly unprecedented level.

[00:19:47] JR: Yeah. So they did mention the satellite data, which was acquired from space-based ADSB, which more than likely has a bit more runtime than the ground-based ADSB that Flight Radar 24 is currently using. But what doesn't sit well with me right now is that what we have seen from Flight Radar and other sources from the ground-based ADSB is we've already known since the crash immediately happened that the profiles look very, very similar. I don't know what they've seen in satellite, what additional data there is. But when people have already compared, Lion Air and Ethiopian, the profile is very, very similar from basically as soon as we knew the aircraft had gone down.

[00:20:32] JO: I think they certainly have a greater level of granularity, and I think that I can't help but note that, today, here we are, we're recording this on the 13th of March, 2019. Exactly five years ago today, the world was learning about the satellite data that was a left by MH370. I find it pretty amazing that we're still in an age where we're relying increasingly on hard to get data for accident investigations. I'm wondering whether or not that we're going to be looking at this in a different way, and I wonder whether or not Aerion's existence in its own right, and here we are 5 years later, and it's assistance on this investigation actually is an indirect outgrowth of what we saw five years ago.

So I don't know what the level of granularity that Aerion has. What you see is the increasing scope having to go to space to begin to understand what is causing major catastrophic accidents that are still notably incredibly rare.

[00:21:35] IP: So, Jon, when we were discussing the incident, the kind of correlation between the – Not correlation, but the similarities, you mentioned kind of some of the issues that investigators looked at with the Lion Air flight, and one of those was we talked about angle of attack and the disagreement sensors that – Or not the disagreement sensors, but the disagreement displays, indicator, that is available to pilots. If I'm not mistaken, that is the 737 MAX. That's an optional function or a feature that is available but doesn't necessarily come on all of the aircraft. Is that correct?

[00:22:15] JO: That is true. That is true. What I understand, at least three layers of angle of attack, indication and kind of protection. So an airline can get – Again, this is at least not exhaustive necessarily, but they can get a head's up display, so a glass display, the pilots looks at projected with flight data directly in front of their faces. They don't have to look down. There's an angle of attack indicator on there. That's number one.

Number two, you can get the same PFD indicator on the primary flight display, which is the big glass displays as they look down. Then the next piece is actually a disagree light which says that there's the data going into each of the two different sensors is not correct. All three of those are optional and they are available at additional cost to operators.

Lion Air, being a low-cost carrier and operating with a very light level of optional equipment, did not have any of those three. So what we saw was essentially a guardrail was not in place that they were taxiing out, investigators said that the AOA indicators were already disagreeing by 20 degrees. So, literally, one thought the airplane had the nose pointing in the air and the other had the nose pointing, well, level, because it was still on the ground and taxiing out.

Had that been in place, there would have been an alert. There would have been an indication on the display saying, "There is a disagreement." That is not mandated by the FAA. It's not a delivery requirement. I would be extremely surprised when all this is said and done regardless of what comes out of Ethiopia and that investigation, whether or not that becomes a standard feature on the deliveries, all commercial aircraft deliveries. I think there's going to be a number of hard questions that Boeing and its chief regulators going to have to answer around why that was optional in the first place.

[00:24:12] JR: So I'm reading this statement issued by the Allied Pilots Association representing 15,000 pilots from American Airlines and they had a particularly interesting sentence that reads, "2,000 737 MAX aircraft in the American Airlines fleet are the only ones equipped with two AOS displays, one for each pilot providing an extra layer of awareness and warning." I interpret that sentence to mean that they are saying American is the only airline in the world of 73 MAX airline operators that actually has the AOA disagreement displays. Could that possibly be correct?

[00:24:51] JO: I do not know. Like I said, the PFD – So the indication on the PFD is an option. But if you have a HUD, you have it looking straight ahead also.

[00:25:02] JR: But it still just strikes me, and I hope this is something that is investigated as particularly irksome that such a basic safety indication could somehow be an optional feature considering how important MCAS has become recently, and I assume this is something that Boeing's software update that's coming in April will address. But it just does not sit well with me that this kind of indication could be an optional safety feature.

[00:25:31] IP: So I want to shift gears now and discuss a little bit about how the grounding of the 737 MAX unfolded both from a regulatory standpoint, which I think is something a bit unprecedented, but also from, I guess, call it an optical standpoint or a consumer standpoint. I guess we can kind of jump in to the regulatory standpoint, which is that I can't recall a single instance where a hodgepodge of national regulators, super national regulators and individual airlines all at various points in time decided that they were going to stop.

[00:26:13] JR: Yeah. I mean, my memory only goes back so far, and I feel like the last time this possibly could have been applicable is with the DC-10, but I don't know of any point in history where there was such a hodgepodge of airlines and regulators and governments and even the president of the United States saying this aircraft is going to be grounded. Optically, in my opinion, this was horribly done to have airlines in different countries on different days of the week kind of just grounded from their own country and then the airspace. It's a total mess and it was handled really poorly all around, I think. I think there's been a bit of a credibility hit towards

the FAA. But Jon, I'm interested to get your opinion. Is there anything like this? Is there any precedent from this in the past?

[00:27:06] JO: No. I mean, the last time – So when the 87 was grounded, I think the sequence of events is important to remember. There's a first battery incident in early January, and then if I recall correctly it was about 7 to 10 days later, the second happened on an ANA 787. The first one, the JAL 787 in Boston, and on the second incident, the aircraft made an emergency landing. The passengers and crew exited via slides, and both airlines grounded their fleets.

So the first two airlines, the biggest operators of the 787, JAL and ANA said, "No, we're standing down." Almost immediately after that, the FAA ordered the grounding as well, and it was swift, but what they saw was the immediately link around the battery incidence that there's a chance that this could bring down the aircraft if uncontrolled. But that sequence again was the airline making the decision, then the FAA and other regulators followed shortly thereafter.

In this particular case, there was – It took 36 hours or actually, it says, much longer than 36 hours. Probably a full three days here, to get to the point where they had enough information to say, "Send it down." But here's the problem, and this is the sequence of events. This is a factual sequence of events that as Boeing announced today, that they were the ones who recommended the standout. That was what their statement said. And that the FAA and the NTSB agreed with them around the recommendation to stand out the airplane.

Yesterday, Dennis Muilenburg, Boeing's CEO, was on the phone with President Trump asking him not to ground the airplane. So regardless, Boeing was asking for the opposite to happen yesterday. So here we are 24 hours later and there was 180-degree difference. So that tilt, that pressure, because that's what the phone call was, it was a request, ultimately had other regulators saying, "Well, no. Out of an abundance of caution, out of the incredible aberration that something like this is, again, in an era of aviation safety that you stand this thing down and you take that precaution."

So, certainly, the FAA, they wanted to be data-driven, they wanted to see that there was a link between the two accidents potentially. But certainly, again, micro versus macro, the micro data

being what's on the recorders. The macro is, "Okay, let's look at the pressures that this design has been under over years and say, "Okay, look at the statistical aberration that it is and take action."

[00:29:41] IP: So we're entering a period I think of great uncertainty until we know much more about the specific events, sequence of events, that led to the crash of Ethiopian 302. We have a global fleet of around 350 aircraft, nearly 400 aircraft, that are no longer flying with 50 some operators. As we discussed a few minutes ago, we don't know what it will take to get the fleet back in the air.

So, Jason, I mean, you're much more in-tuned to the commercial side of things than I am. What do you see is the effect on operations? Who's impacted here and what are the workarounds?

[00:30:26] JR: So operationally, the biggest operator of the 737 MAX right now is Southwest. They have approximately 35 aircraft and they're also dealing with a bit of a crunch with fleet availability as a whole as they're kind of going through a tiff with their mechanics right now. So they have a large number of NGs out of service as well. So Southwest is going to see quite a bit of impact.

American is the second largest operator, I believe, of the 73 MAX.

[00:30:56] IP: I just want to point out that as a side note, in a normal episode of AvTalk, the story of Southwest versus their mechanics would have been a much larger portion of the show. In this particular week, we'll just have to leave it there and come back to it in another episode.

[00:31:10] JR: It's a side note today.

[00:31:11] IP: Yeah.

[00:31:12] JR: So American will be able to absorb it, but they're also dealing with issues with their NG fleet. They've had a bunch of NGs grounded due to some inspection issues with refurbished aircraft. Air Canada has had to cancel a number of transatlantic flights that operate with the 73 MAX. Norwegian is actually substituting in the 787 that they somehow found

available and they're sending that to Stewart New York combining that with the Providence Rhode Island flights.

But most of the other airlines, United, the Chinese Airlines' goal is actually borrowed Delta A330, I think. They'll be able to absorb a good number, if not all of the flights into their other aircraft, and there won't be much of an impact. There will be some impact, like I mentioned, with Air Canada where they do not have another aircraft that can operate that flight.

But generally speaking, there are only 300 to 400 73 MAX aircraft out there in the world. So it's not like we're talking about thousands and thousands of aircraft. So airlines will figure this out, but keep an eye on your booking. I have a flight booked on Iceland Air with the 73 MAX 8 at the beginning of April. I'm looking to see what they're eventually going to swap that out to if this grounding is prolonged. But operationally, a lot of airlines will absorb this into the rest of their fleet. I don't foresee a huge impact.

[00:32:42] IP: What's interesting to me are the airlines that have really started rebuilding, very small airlines that have basically started rebuilding their fleets based on the 737 MAX. I'm looking at like Mauritania has 25% of their four aircraft fleet.

[00:32:59] JR: Yeah, I mentioned them specifically yesterday.

[00:33:00] IP: The Fiji Airways.

[00:33:02] JR: I said what is it going to take to get Mauritania to ground their 73 MAX, because like you said, there's literally 25% of their entire operating fleet. Lo and behold, they didn't operate their 73 MAX today. So they actually beat the U.S. to grounding the MAX even though they heavily rely on that one single aircraft.

[00:33:22] IP: Yeah, and Fiji, which operates in think two at this point.

[00:33:26] JR: In Kazakhstan.

[00:33:27] IP: [inaudible 00:33:27], yup. Has one, I believe. And Comair took delivery of theirs just before grounding them.

[00:33:34] JR: Right. So fortunately, the 73 MAX is just being introduced into a bunch of airlines right now. So it's not a huge operational impact. Jet Airways has been mentioned a number of times, but their 73 MAXs were already grounded before the Ethiopian crash because of financial issues.

[00:33:54] IP: Which, again, in a normal episode, would have been a much larger portion of episode.

[00:33:56] JR: Would have been its own topic. Yes.

[00:33:58] IP: Yes.

[00:33:58] JR: Iceland Air only has a couple in operation. They'll throw some 75s on the routes. Really, the biggest impact I think is indeed going to be Southwest, since they're the largest operator right now. So if you are booked on a Southwest flight in the coming days, definitely check your flight information to see what is happening with that.

[00:34:21] IP: So before we leave this, I want to just kind of give some things that we should be looking out for in the near future. As we wrap up our discussion with Jon, I just want to note that the last passenger-carrying 737 MAX is on final approach to Newark, Southwest flight 2569 is about 5 minutes from landing. The only other 737 MAX aircraft in the air are ferry flights that are either returning from outstation back to their home base or to another location where they will wait out the grounding. So the last passenger aircraft is about to land.

[00:35:04] JR: This was a Southwest transcon flight. Those do exist, Oakland to Newark. Jon mentioned before we started recording actually, that this flight actually has in-flight Wi-Fi. On top of that, live TV streaming. So the passengers on this flight are probably aware that they are on an aircraft that is effectively been globally and they're on the last flight that is still operating. That's got to be weird.

[00:35:30] IP: Yeah. I mean, I would feel comfortable on them. I will say this, I would feel comfortable flying in a 737 MAX at this point.

[00:35:37] JR: It's still got to be weird, but yeah. I would fly –

[00:35:40] IP: It would be weird knowing that when you land, that plane can't take off again.

[00:35:45] JR: Right. It's fine. It's fine. We're in the air. It's safe. Just it's not going to take off again, because it won't be safe.

[00:35:53] IP: An interesting stasis to be in. But what I want to do is kind of get some last thoughts from Jon and some things that we want to be looking out for. The most important thing as far as any crash investigation is concerned is certainly the analysis of the flight data and cockpit voice recorders, which they're on their way to Paris for inspection and analysis, and that will be something that we're certainly following very closely.

The other are kind of any continued updates from the FAA, especially as the certifying body of the 737, and then additionally, any updates from other authorities and regulators when they see the 737 MAX coming back into the air.

Jon, is there anything else that people following this would be wise other than to subscribe to the Air Current and read your reporting. What else should people be looking out for?

[00:36:45] JO: First off, thank you for that. I appreciate the endorsement there. I think one thing that is tremendously important, and I don't think this can be overstated, really, that any threat to the 737 is a threat to Boeing's very existence. Taken to its extreme, if this is not handled in a way that gets resource confidence and trust in the airplane, that this airplane is the lifeblood of Boeing. It pays for everything. It keeps the lights on. The effect of that, certainly, we're in a duopoly and there aren't a lot of choices that airlines have. But in terms of the seriousness of this, the 737 in the context of the Boeing company, the United States of America's largest single exporter, relies on this airplane to stay alive.

So getting this right, there is almost no margin for error here, as this airplane is brought back into service and brought back into service in a way that its operators, global regulators, and ultimately, the flying public, have confidence in.

[00:37:55] IP: This has been a truly enlightening conversation with the Air Current's editor-in-chief, Jon Ostrower. Jon, I want to thank you for being very gracious with your time today and we'll certainly check in with you in the near future as we learn more. Thank you so much for joining us today.

[00:38:12] JR: Jon, thank you as always.

[00:38:15] IP: We're going to take a short break and we'll be back in just a moment to discuss the situation in Indian, Pakistan and update from the National Transportation Safety Board on Atlas air flight 3591 and a few other things that have happened in the past couple of weeks.

Stay with us, we'll be back in a moment.

Welcome back. It's time to discuss some of the other things that have happened in the past few weeks. It feels like this began forever ago, but Pakistani Airspace is still closed to most overflights. We're in to the, I think, 14th or 15th day of this closure. I mean, we're definitely into the 3rd full week of closure to most overflights.

[00:39:08] JR: Yeah.

[00:39:09] IP: A quick update – Yeah, go ahead.

[00:39:10] JR: I mean, I'm just going to say, I still don't quite understand what is going on here. I just know that Pakistani airspace is closed to most overflights and it's causing some pretty crazy routings that happened around it.

[00:39:24] IP: Yeah. So the overflights that Pakistani and Indian airspace, both of those pieces of airspace are very heavily used to the tune of about 400 flights a day for overflights transiting mostly from Europe to South East Asia. So think flights going from Europe to Thailand,

or Vietnam, or Singapore, or even beyond to places like Australia sometimes, depending from where in Europe they're coming.

But those routes are currently closed. The overflight routes that are still open or that have been reopened and reopened for a few days now are the routes that take aircraft from the gulf airports, so Abu Dhabi, Dubai, Kuwait, places in that region and kind of take them up into Chinese airspace. So flights to Beijing, Shanghai and places like that, those routes are still available.

But there are all sorts of restrictions that we've been following for certain flights and airports, certain flights going to certain airports can't fly through certain airspace to get to other airspace that they have to go through the third airspace, and that's what's ended up happening to a Thai Airways flight that was flying from Karachi home to Bangkok. They got caught in NOTAM jail basically.

[00:40:50] JR: Yeah. We were watching this flight takeoff and what you get from Pakistan to Thailand is not by going west. You go east, but east was not immediately available for this flight, and air traffic control guided them out over the sea and then they just kind of started doing circles. What I'm told, I've talked to a couple of pilots about this, is basically they were given instructions to just keep turning left and they weren't instructed to hold over a specific point, but just keep turning left. High winds over the sea kind of drifted them back to the east. So they kept making these like roller coaster style loop to loops out back towards Pakistan.

[00:41:36] IP: So it looked like the spiralizer.

[00:41:38] JR: Yeah, exactly.

[00:41:38] IP: Like a kid's toy.

[00:41:39] JR: It was pretty damn confusing, because you looked at it and say, "What the hell are they doing?" Eventually, I guess they figured out their routing. They headed back west and it looked like they were going to divert to Dubai, but they ended up turning back east again. By the

time they had really past south of Karachi, where they started from, it was already like two hours into the flight.

[00:42:03] IP: Yeah. So what ended up happening is they – And it's still unclear to me why they departed on the routing that they did given that this information was available to them at the time of departure. So that part is still unclear to me. But what happened was is because flights from Pakistan cannot fly directly into Indian airspace, they have to go through a third airspace, a third country.

So what they had planned to do is fly through the Muscat FIR and then into Indian airspace. Because of all of the traffic that has been moving into the Muscat FIR, they've taken a bulk of that overflight traffic, because it's basically moved south to avoid Pakistan. They said, "We're closed. You can't come this way. You can't fly from Pakistan to Muscat. We're not going to allow it."

[00:42:58] JR: Yeah. This seems like the kind of thing that they should have arranged before they took off and delayed takeoff, because I can't imagine how much fuel they wasted holding –

[00:43:07] IP: I mean, it's not even delaying a takeoff. I mean, what they ended up doing was flying through Iranian airspace to get around the not going from Pakistan to Muscat, the FIR. So they flew into the Tehran FIR, then they flew into Muscat, then they got back on track into the Mumbai FIR and on they went.

[00:43:25] JR: What did they call it? A tactical rerouting?

[00:43:28] IP: Yeah. So there were a couple of notes that the Muscat FIR issued. One was that they're closing the entry point, the waypoint to traffic coming out of Pakistan. The other was that they said that aircraft will be subject to tactical rerouting, which basically means you could file a flight plan. We'll do our best, but because we're dealing with so many extra planes, you may end up flying further.

So it was basically a notice that aircraft should tank extra fuel just in case they end up flying further, which – I mean, I'm not sure if the Thai 747 needed extra fuel for this particular route, or if it just had enough to begin with. But they eventually got home, but a few hours later.

[00:44:11] JR: I still don't know what this whole airspace scuffle is about, but hopefully they figure this out soon.

[00:44:17] IP: I mean, what's most, I guess, confounding to me is the daily – So there's the standing NOTAM that gets updated basically once a day that says Pakistan airspace is closed to general overflight traffic. Here are some restrictions. There are the airports that are available, etc., etc., and they just bump it back by 24 hours every day, and it's very unclear to me at this point why there have been political explanations and military explanations that are less than satisfying to my ears. They don't necessarily explain the entire situation.

Granted I'm not an India-Pakistan conflict expert, this all began out of rising tensions and aircraft that were shut down, but a few weeks later –

[00:45:04] JR: Military aircraft.

[00:45:06] IP: Yeah. Sorry. Sorry. That's an important point to make. So that all began, and tension seemed to have eased, but here we are with nobody really budging. Pakistan the other day, this is Wednesday the 13th I believe. It was the 11th, the 10th of 11th, said, "We tried to open up some airspace and let flights go through, but India said no." It was very passive-aggressive NOTAM, which is very interesting to read. So India put out their own NOTAM that said, "No, you can't," and here we sit. So things continue to be maddeningly complex for flights that are flying basically just west of Pakistan to India that have to go way out of the way to make it to their destinations.

[00:45:56] JR: What else happened in the last two weeks that felt like an eternity?

[00:46:00] IP: Well, the update that we have today, yesterday and today, is to the Atlas Air 3591 crash, the 767 cargo aircraft just outside of Houston. The NTSB issued an investigative update, which isn't the final report. It's just this is what we've learned FYI. So yesterday, they

came out and described in some detail the final moments of the flight and some of the flight control issues that the aircraft was experiencing in there.

So what happened was is that at about a few minutes before the Aircraft crashed, they had leveled off at about 6,200 feet. They began a slight climb to 6,300 feet. The aircraft began to encounter small vertical accelerations. These are the NTSB words right now, "Small vertical accelerations consistent with the airplane entering turbulence. Shortly after when the airplanes indicated airspeed was steady at 230 knots, the engines increased to maximum thrust and the airplane pitch increased to about four degrees nose up. The airplane then pitched nose down over the next 18 seconds to about 49 degrees in response to nose down elevator deflection. The stow warning stick shaker did not activate." That is an updated investigative update from the NTSB, which yesterday, the language was not in response to nose down elevator deflection. It said, "In response to nose down control column input," which was very distressing impossible implications.

[00:47:39] JR: Yeah, they didn't so much say why they think there was nose down column input, but we were pretty much all inferring nothing good from that statement.

[00:47:49] IP: Right. So, today, there was a revision to that statement in response to nose down elevator deflection, which certainly changes –

[00:47:58] JR: Big difference.

[00:48:00] IP: Yeah, exactly. It changes the ideas behind what may or may not have happened. So that's an ongoing investigation, certainly, but it looks like investigators are well on their way to figuring out what happened now comes obviously the more difficult question of why it happened. I'm sure they're looking at the wreckage as best as they can now.

The other incident that happened over the past two weeks was one in which, thankfully, no one was injured, but rather stark photographs, a series of photographs came out of it in Northern Maine.

[00:48:36] **JR**: Yeah. This one was Presque Isle, Maine. I'm sure we'll get some hate mail about my pronunciation of that.

[00:48:42] **IP**: I will say Presque Isle.

[00:48:45] **JR**: Presque Isle, whatever it is.

[00:48:48] **IP**: But if you're from Maine, if you're a Mainer, please podcast.fr24.

[00:48:52] **JR**: Is it Mainer?

[00:48:53] **IP**: Yeah. That one I'm getting right.

[00:48:55] **JR**: Mainite?

[00:48:55] **IP**: They're Mainers.

[00:48:56] **JR**: Mainite?

[00:48:56] **IP**: No, they're Mainers. They're Mainers. That one I actually know.

[00:48:59] **JR**: You probably saw in the news that a United Express operated by commute air, I believe. E140 flew into your lovely airport there.

[00:49:09] **IP**: E145.

[00:49:11] **JR**: Went off the runway into a snow bank that was probably damn near ice from what it looked like, and the landing gear ended up somewhere it's not supposed to, which is lodged between the rear mounted engine and the fuselage, which if you're familiar with an E145, is I think not where the landing gear goes, is it?

[00:49:32] **IP**: Definitely not.

[00:49:33] JR: No.

[00:49:33] IP: That is certainly not the location where the landing gear is supposed to be. You don't want your left main landing gear between your left engine and your fuselage, especially after encountering a runway overrun.

[00:49:51] JR: Yeah. So that looked pretty terrible, but thankfully no one was injured. That aircraft might be written off. I don't know. It's an E145. So who cares at the end of the day? You eliminate one and another will take its place from the dessert. But yeah, thankfully no one hurt, but it just looked ridiculous. I guess they hit a snow bank just in the right way that it sheared off the landing gear. I've never seen anything quite like that.

[00:50:19] IP: And flipped it up into the engine. Yeah. I mean, in all seriousness, it's probably a very good thing that it went up and wedged itself where it did rather than hitting the engine. That's I think a lucky break there.

So this has been an incredibly heavy episode. One in which I think we've got an amazing amount of information, especially from our conversation with Jon. There're a lot to kind of sift through over the next week, or two, and our next episode, hopefully we'll know much more about what happened in Ethiopia and the fate of the 737 MAX fleet.

But I do want to end on a positive and Av-geeky note just to – I don't know, leave with something.

[00:51:11] JR: What do you got here? Where are you going?

[00:51:12] IP: I'm going to the U.K. and I'm going to say the Landor 747, the British Airways rolled out last week.

[00:51:23] JR: Oh, yeah, it did.

[00:51:24] IP: It just a beautiful, beautiful aircraft.

[00:51:27] JR: It just looks bright. Like it belongs on the aircraft probably because that aircraft is so old that it originally wore that livery before it was retro.

[00:51:39] IP: You are correct, sir.

[00:51:40] JR: Which is pretty amazing, but this is 3rd in the series of British Airways retro liveries. Our first was BOAC, then we got the EA, and that we have Landor. So we have one more to go, and which one do you think it's going to be?

[00:51:59] IP: I hope it's [inaudible 00:52:00], but –

[00:52:01] JR: I hope they pick one of the wacky whirl tails from a little while ago, like whichever one people hated the most, because I love those.

[00:52:09] IP: Take your pick.

[00:52:10] JR: I think they were fascinating, but I really hope they go with one of those.

[00:52:14] IP: People really for some reason just didn't like them, but I don't even know where that visceral reaction comes from. But the Landor livery does look really sharp.

[00:52:23] JR: It just looks like it belongs on that aircraft.

[00:52:27] IP: Yeah. So the registration on that, we'll toss it in the show notes, is Gulf-Bravo-November-Lima-Yankee, G-B-N-L-Y. So we will put a link to that one in the show notes so that everybody can take a look at that.

Episode 53, a full one, one I hope that everyone to be more informed about this situation. I know I am. It's always good to talk to Jon, and we'll certainly have to have him back in a future episode as things progress.

I am Ian Petchenik, here as always with –

[00:52:58] JR: Jason Rabinowitz, and thank you all for listening.

[END]