Statement of Michael Stumo

Before the
United States Senate Committee on Commerce, Science and Transportation

Examining the Federal Aviation Administration's Oversight of Aircraft Certification
June 17, 2020

Thank you Chairman Wicker, Ranking Member Cantwell and the members of the Committee on Commerce, Science and Transportation for holding this hearing and allowing me to submit this written statement.

My name is Michael Stumo and I am the father of Samya Rose Stumo who died on flight ET302 on March 10, 2019. Her 26th birthday will be in less than two weeks. I speak for my family but not for the other ET302 families.

Recent legislation introduced by Senators Wicker and Cantwell improves upon a prior version of the bill. But it is not yet supported by my family or, as many have communicated to me, the other families of Flight ET302. My testimony includes several issues that must be addressed in future improvements to this legislation.

1. The JT610 Crash

A Boeing 737 MAX 8 crashed into the Java Sea on October 29, 2018 killing all 189 passengers. The Lion Air plane was only three months old. The flight JT610 pilots fought with what we now know was the MCAS system for 13 minutes before the crash. An angle of attack (AoA) sensor had previously malfunctioned and been replaced. The replacement sensor again malfunctioned, there was no redundancy in case of failure and thus the MCAS system repeatedly pushed the nose down until it overpowered the pilots and slammed the plane into the sea.

After that crash, the JT610 pilot's mother, Sangeeta Suneja, raised the alarm about the plane and called for simulator training. But few paid attention to her. Many blamed the pilots. Boeing said the MAX 8 "is as safe as any airplane that has ever flown the skies."

It was not. My family and I now know much more than before.

2. The ET302 Crash

On March 10 last year, my daughter Samya was traveling on her first international assignment for her employer. She had recently graduated from the University of Copenhagen School of Public Health and landed her dream job at ThinkWell in January 2019 to help cause patient centered change in the global health field.

Samya flew from Dulles to Addis Ababa. After she arrived, Samya texted us, "Just landed in Addis Ababa - another 2 hours to Nairobi." She boarded a Boeing 737 MAX 8 at around 8:30a local Addis time. She sat in seat 16J, an aisle seat.

Flight ET302 was a daily flight between the two cities, often carrying US diplomats to and from Nairobi. The plane was only four months old.

As flight ET302 took off, something went wrong with the left hand angle of attack (AoA) sensor. There was another AoA sensor on the co-pilots' side. It was working properly but it was not connected to the MCAS system.

The MCAS system wrongly kicked in, repeatedly pushing the nose down soon after takeoff. Captain Sully Sullenberger said:

> "the failure of an AOA sensor quickly caused multiple instrument indication anomalies and cockpit warnings. And because in this airplane type the AOA sensors provide information to airspeed and altitude displays, the failure triggered false warnings simultaneously of speed being too low and also of speed being too fast. The too slow warning was a 'stick-shaker' rapidly and loudly shaking the pilot's control wheel. The too fast warning was a 'clacker', another loud repetitive noise signaling overspeed. These sudden loud false warnings would have created major distractions and would have made it even harder to quickly analyze the situation and take effective corrective action."[1]

For several minutes, the captain used brute physical force to pull the control yoke back up. He became exhausted and asked for the first officer's help. During the six minute flight, my daughter was terrified riding this roller coaster. At 8:43 am local time, the plane plowed into the ground, in an Ethiopian farm field, and buried itself dozens of feet below the surface.

The plane and the passengers disintegrated into pieces. Their parts were mixed up with the jet fuel. I was there. My family and I were at the crash site. We saw the wreckage. My wife and son saw body parts exposed to the elements.

3. The Boeing 737 MAX 8 Development and Concealment

The MAX is an Obama era plane that was certified to fly in March 2017, the third month of the Trump administration.

It is a deadly aircraft with ill-fitting engines bolted onto a 50 year old aircraft design. Rather than physically fixing the aerodynamic design of the aircraft, Boeing took the cheap route. It used glitchy software that relied upon input from a single sensor to push the nose of the plane towards the ground in certain conditions.

Even today, the FAA still has not resolved the issue of whether MCAS exists to make the MAX handle like prior planes or to resolve aerodynamic instability. Until FAA can answer that question, the MAX should not fly again. It may be that the aircraft is so flawed that physical changes, rather than software fixes, are required.

[1] Attachment 3: Testimony of Sully Sullenberger, US House of Representatives, Committee on Transportation and Infrastructure, June 19, 2019 (attached)

Boeing hid MCAS for many years. In June 2013 the company first devised a plan to conceal MCAS from the public and to minimize its existence for the FAA. It was described as merely "an addition to [the existing] speed trim [system]".[2]

In 2016, Boeing drastically strengthened MCAS' ability to push the MAX's nose down. It never informed the FAA or anyone else of this change. Neither Boeing nor FAA performed a safety assessment which was necessary for critical safety systems. In May 2019, then-Acting FAA Administrator Dan Elwell admitted that Boeing and the FAA failed to designate MCAS as a safety critical system.[3]

The MCAS violated Boeing's internal requirements requiring that the systems should "not interfere with dive recovery" and "not have any objectionable interaction with the piloting of the airplane."[4]

The effort to hide MCAS continued throughout 2016 as the FAA allowed Boeing to remove references to MCAS from Boeing's Flight Crew Operations Manual.[5] The company wanted to avoid simulator training. In November 2016, Boeing chief technical pilot Mark Forkner wrote to a colleague that he was "jedi-mind tricking regulators into accepting" lesser pilot training.

One Boeing employee rejoiced when the FAA said there should only be computer-based training, without a simulator. "You can be away from an NG for 30 years and still be able to jump into a MAX? LOVE IT!!… This is a big part of the operating cost structure in our marketing decks."

In 2017, a Boeing employee wrote, about the MAX, "This airplane is designed by clowns, who are in turn supervised by monkeys." In 2018, another employee wrote "I still haven't been forgiven by God for the covering up I did last year."

The FAA's years long drive to delegate everything and relegate staff to paper pushers and presentation watchers resulted in Boeing employees mocking them as "dogs watching TV." The FAA remains happy to be sidelined, rather than have direct involvement in certification.

4. Between the Crashes: What were they doing?

After the Lion Air crash, FAA knew that MCAS was a problem, but failed to ground the plane. They blamed the pilots for not winning the fight with the then-secret MCAS system.

One can argue whether the FAA and Boeing should have known about the aerodynamics issues, the AoA sensor and MCAS's catastrophic risks before JT610. But after JT610, there is no excuse.

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[2] "The Boeing 737 MAX Aircraft: Costs, Consequences, and Lessons from its Design, Development and Certification," The House Committee on Transportation & Infrastructure, p7, March 2020.
[3] Id.
[4] Id.
[5] Id.

On December 3, 2018, the FAA's internal risk assessment projected that there would be at least 15 more MAX crashes without a fix.[6] The agency did not require Boeing to fix the problem but instead issued an Airworthiness Directive that still did not disclose the MCAS. Rather it re-iterated the procedure for handling runaway trim, which Captain Sullenberger said was very different. American Airlines pilots, in a meeting with Boeing, complained that the company hid MCAS from them.

But secretly the FAA asked Boeing for a software fix within 10 months. My daughter died in the ET302 crash before the 10 months were up. They gambled with her life, and we lost. As did 156 others on the plane.

Even in December 2018, Boeing was falsely reassuring the FAA that pilots could handle MCAS failures. In a slide deck obtained by the House Transportation and Infrastructure Committee, Boeing told FAA that:

- repeated MCAS activation were readily recognizable and able to be counteracted;
- the action to counter the failure should not require exceptional piloting skill or strength;
- the pilot will take immediate action to counter; and
- trained flight crew memory procedures shall be followed.

(See attached Boeing slide deck from December 18, 2018, page 11).

There was no evidence that pilots could react immediately. In fact, Boeing own analysis revealed that if pilots took more than 10 seconds to react, the result would be catastrophic.[7]

5. FAA Resistance and Denial Continues

To this day, the FAA has not admitted any mistakes. Instead, it strategically shifts the focus to its US-centric history of no recent crashes despite the international reach of America's aviation system. My family hoped that new Administrator Steve Dickson would show leadership and clean up the agency. But he has not. No new management team has been chosen. Nobody who made mistakes has been disciplined. Transparency is proclaimed in words but not by deeds.

Administrator Dickson, Deputy Administrator Dan Elwell and others promised that families would receive answers to our questions and be informed of the agency's actions as it determines whether and when to unground the MAX. We received no documents when we asked for them.

We were then told to submit a Freedom of Information Act (FOIA) request. We did so on October 28 2019. But the FAA has still refused to provide us with any documents in response to that request.

A passenger advocacy group, Flyers Rights, requested information, pursuant to FOIA, about the data and analysis surrounding whether and when to return the MAX to service. FAA refused to provide the information. Flyers Rights went to court seeking an order requiring the FAA to

[6] Attachment 4: Boeing slides prepared for FAA, December 18, 2020, obtained and publicly disclosed by US House of Representatives, Committee on Transportation and Infrastructure.
[7] The Boeing 737 MAX Aircraft, supra at 9.

provide the information. The FAA has used every legal tool in its arsenal to prevent disclosure of the documents requested.

On August 1, 2019, my wife Nadia and son Tor met with FAA Safety Director Ali Bahrami who previously worked for an aviation industry lobby group. He was a substantial part of the FAA's "blame the pilots and leave Boeing alone" approach. Bahrami never admitted to my family that the FAA made a mistake by not classifying the MCAS as a critical safety system. When my son asked if there was anything he would do differently, he said "no, they did everything right."

Having been denied information and assistance from the FAA, we searched for answers on our own. We learned from Boeing engineers that the change from Designated Engineering Representative (DER) to Organization Designation Authorization (ODA) was a clever and opaque bureaucratic alphabet soup method to hamstring the safety culture at Boeing.

Under DER, the FAA appointed, supervised and removed the Boeing engineers that were designated with certification authority. Boeing paid the engineers, but the DER reported both to FAA and Boeing. That dual chain of command prevented the profit and timeline pressures of Boeing managers from overruling safety concerns.

That safety culture changed when FAA changed to ODA and Boeing was designated as an organization with certification authority. The Boeing engineers, now called ARs, were isolated from their FAA counterparts, reporting only to Boeing managers. Boeing engineers with safety concerns could be shut down and reassigned if company profit or timeline goals were threatened.

While it is easy to lose the thread among the acronyms, this organizational culture and chain of command dynamic must be grasped and fixed. Boeing engineers told me that the DER system resisted undue influence while the ODA system invited undue influence.

The Joint Authority Technical Review, composed of international aviation agency experts, found that "there are signs of undue pressure on [Boeing engineers] performing delegated functions".[8] Congress needs to re-establish the direct communication between FAA and Boeing engineers at the ground level. FAA also needs to be able to appoint, supervise and remove those Boeing engineers so they cannot be subject to undue influence from Boeing managers to compromise safety.

The Joint Authorities Technical Review report also found dozens of faults with FAA's certification process. It found, for example, that the FAA's Boeing Aviation Safety Oversight Office (BASOO) office is simply not equipped with the quantity and quality of personnel that can oversee Boeing. FAA has not responded to that report.

The FAA will continue delegating to Boeing unless Congress stops it from doing so.

In March 2017, the FAA released a report called "A Blueprint for AIR Transformation". Dorenda Baker, Executive Director of the Aircraft Certification Service, signed the document.

[8] "Joint Authorities Technical Review (JATR), "Boeing 737 MAX Flight Control System: Observations, Findings, and Recommendations," pg 28, October 11, 2019.

The AIR Transformation report is a blizzard of management consulting words conveying aspirations towards communications with stakeholders, innovation and strategic vision. But the core of that report was intended to continue getting FAA out of the business of direct involvement in critical paths of the certification process. Three unions - PASS, NATCA and AFSCME - wrote a dissenting report showing how the FAA's paper-pushing, management consulting approach compromises the safety of aircraft passengers.[9]

The FAA's core vision is apparently to push paper and watch power point presentations compiled by Boeing. The public expects FAA to engage in direct involvement, acting as the check on an aircraft manufacturer's urge to cut corners to save a buck.

The FAA currently shows no intention of freeing itself from capture and directly engaging in certification functions rather than merely pushing paper. A recent Special Committee report of hand-picked industry insiders issued a January 16, 2020 document that copied and pasted past FAA talking points about delegation and its long and safe history.[10] Unsurprisingly, FAA agreed saying that "the delegation system allows U.S. industry and innovation to thrive".[11] Nobody - except FAA and its handpicked insider committee - believes that this version of delegation is fine. Congress must be very specific in demanding more direct involvement by FAA in the certification process because FAA will not otherwise do it.

The October 2019 JATR report, appointed by FAA, found dozens of problems with FAA's delegation process and the certification of the MAX. FAA has not responded to the JATR report, apparently choosing only to respond to more friendly reports.

I have also been told by inside whistleblowers that Boeing did not engage in safety assessments of critical systems beyond MCAS in the MAX. Safety assessment is an analysis of the identified hazards for a system and demonstrates compliance with airworthiness regulations. Congress should require FAA to disclose the safety assessments for all critical systems in the MAX before it is allowed to fly again.

6. Legislation needed

ET302 victims families were very disappointed at the lack of substance in the first draft of legislation filed in the Senate this month. The second draft filed recently is improved in that it obligates FAA to appoint, remove and communicate with Boeing engineers performing certification work. It also protects whistleblowers throughout the supply chain.

While the recent legislation filed by the Chairman and Ranking Member improves on a prior version of the bill, this second draft is not yet supported by my family. We believe that other

[9] "Aircraft Certification 'Transformation' Pre-Decisional Involvement Report, Union Recommendations and Dissenting Opinion, February 6, 2017.
[10] "Official Report of the Special Committee to review the Federal Aviation Administration's Aircraft Certification Process," Chaired by Lee Moak and Darren W. McDew, January 16, 2020.
[11] "Response to Official Report of the Special Committee on the Federal Aviation Administration's Aircraft Certification Process," Federal Aviation Administration,
April 2020.

ET302 families also oppose it without many more improvements. The legislation must also include:

1. Rebalance of delegation. It is absolutely critical that excessive delegation is fixed. FAA must not be allowed to slump further into paper-pusher status, distant from Boeing engineering and the plant production floor.

FAA must retain direct involvement in critical safety systems - as well as novel and new systems - and not delegate its functions to Boeing. Critical safety systems are those deemed major, hazardous or catastrophic. FAA must verify that the fault tree analysis and other analysis are performed to guarantee redundancies and fail safes to prevent failure. New and novel systems are, like MCAS, those not included on aircraft and not fully tested in the past.

2. Lifetime limit for type certificates. The Boeing board, including current CEO David Calhoun, rejected the option to develop a new aircraft to compete with Airbus, opting to amend the old 737 model. They did so to cut corners, save money, extract profit from legacy product, and avoid many current FAA safety rules. The original 737 was certified in 1967. Fifty three years later, it is clear that it should no longer have modern engines and software bolted on to its old fuselage. Boeing should have chosen innovation rather than profitable but unsafe stagnation. A lifetime limit on type certificates should be mandated, and no more future aircraft designs should be based on the 737.

3. FAA certification should not equal immunity for Boeing. Boeing management may bow their heads and express sorrow for the crash. But in private they are doing everything possible to prevent families from holding Boeing accountable. Boeing is asserting, in court, that the fact of FAA certification pre-empts families from making claims for the loss of our loved ones. Boeing's conduct should not be awarded with immunity. This bill should make clear that FAA certification is the bare minimum that manufacturers like Boeing should meet. While I hope no family has to experience the loss of a loved one in a plane crash, legislation should preserve the right to hold all responsible parties accountable.

Boeing management may bow their heads and express sorrow for the crash, but in private they are trying to block families from compensation. Boeing is asserting, in court, that the fact of FAA certification pre-empts families from making claims for the loss of our loved ones. The FAA astoundingly has supported that Boeing view in past court cases. Congress must not let the FAA and Boeing design and certify unsafe aircraft with shoddy and cozy bureaucratic analysis, and then let that collusive certification prevent families from seeking justice.

4. End the secrecy. The National Transportation Safety Board (NTSB) and the FAA have invoked every possible law to prevent families, Congress and the public from receiving information about the causes of the crash and the future ungrounding analysis. The NTSB has prevented the release of many documents held by Boeing. The FAA has refused to comply with families FOIA requests citing expansive caselaw protecting company claims of confidentiality despite the public safety concerns. The result is zero production of documents to the public. This Committee should substantially narrow the scope of legal provisions that hide documents, data and analysis relating to a crash from the public.

5. Penalties must apply or new law does not matter: Boeing has paid civil penalties in the past, but that has not stopped the company from misleading the FAA, pilots and the public. The company pays the penalty from general funds and goes about generating more profit. Criminal penalties with the threat of jail time have the needed deterrent effect for individuals who must then invoke their personal morality rather than company goals.

6. Implement the JATR recommendations. The FAA refused to respond to the Joint Authorities Technical Review report which it commissioned. The international participants in the report were not cozy industry insiders and therefore produced a solid set of findings and recommendations. FAA can congratulate itself for safety. But the public does not trust it and foreign aviation agencies are not deferring to it any longer. This committee's bill should require the FAA to implement the recommendations in the JATR report.

Thank you.

Attachments

1. FOIA letter, Michael Stumo and Nadia Milleron to FAA, October 28, 2019 (pg 10).
2. Joint Authorities Technical Review report, October 11, 2019 (pp 11-81).
3. Testimony of Sully Sullenberger, US House of Representatives, Committee on Transportation and Infrastructure, June 19, 2019 (pp 82-86).
4. Boeing slides prepared for FAA, December 18, 2019, obtained and publicly disclosed by US House of Representatives, Committee on Transportation and Infrastructure (pp 89-131).
5. FAA Quantitative Risk Assessment, December 3, 2018, obtained and publicly disclosed by US House of Representatives, Committee on Transportation and Infrastructure (pg 132).
6. Letter from Mattieu Willm, a French aeronautical engineer who lost his sister, Clemence-Isaure Boutan-Willm in the ET302 crash, dated June 15, 2020 (pp 133-135).