IN UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA
CHARLESTON DIVISION

GEORGE K. THUGGE Estate By His Special Administrator GREGORY D. KEITH, His Children CAMILLA N. NYKVIST, THOMAS K. THUGGE, OLIVIA N. THUGGE, Minor A.B. by ANNA BJÖRK, His Mother JULIET N. THUGGE, and All Other Next-Of-Kin, **Plaintiffs,** **v.** **THE BOEING COMPANY,** a Delaware Corporation; **Defendant.**	**Civil Action No.** 2:19-cv-01443-DCN **COMPLAINT** **JURY TRIAL DEMANDED** **Strict Products Liability Aircraft** **Negligence – Products Liability Aircraft** **Breach of Warranty-Aircraft** **Failure to Warn-Aircraft** **Strict Products Liability–Training and Manuals** **Negligence-Products Liability-Training and Manuals** **Breach of Warranty Training and Manuals** **Failure to Warn – Training and Manuals** **Punitive Damages** **Unfair Trade Practices**

BACKGROUND

THE BEGINNING OF THE 737

1. On January 17, 1967, the 737 was introduced to the world and it first flew on April 9, 1967.

2. But when introduced, the 737 found heavy competition from other aircraft manufacturers, including the Douglas Aircraft Company's DC-9 and the British Aircraft Corporation is BAC 1-11.

3. To cut production time and get the plane on the market as soon as possible to compete with other aircraft manufacturers, BOEING gave the 737 the same upper fuselage as the 707 and 727.

4. On December 15, 1967, the 737-100 was approved by the Federal Aviation Administration (FAA) followed by the 737-200 on December 21, 1967 and the 737-200 C on October 29, 1968.

5. The early 737's and all subsequent 737s including the 737 MAX 8 are all type certified under Type Certificate No. A16WE.

6. Type Certificate Number A16WE is held by The BOEING Company of Renton, Washington and covers the following models with various serial numbers and variations:

"Classic"
737-100; 737-200; 737-200C; 737-300; 737-400; 737-500

"Next Generation"
737-600; 737-700; 737-800; 737-800 BCF; 737-900; 737-900 ER

"MAX"
737-8; 737-9

7. The 737 MAX 8 on March 8, 2017, received type certificate approved under Type Certificate No. Al6WE, as amended.

8. The 737 MAX 8 received EASA Type Validation, based on the FAA Type Certificate approval, by the EASA on March 27, 2017, EASA Type Certificate Data Sheet, No. E9SA.IM.A.120, pages 53 et. seq.

9. No mention was made in either the EASA Type Certificate Data Sheet or the FAA Type Certificate Data Sheet A16WE of the Maneuvering Characteristics Augmentation System (MCAS) from the origins of the 737 through authorizing the 737-8 MAX.

10. By 1987, the 737 was the most ordered plane in commercial history. The 737 line up included the 737-100 and 737-200 and BOEING's then current production models including the 737-300, 737-400 and 737-500.

11. By 1993, BOEING was developing the Next Generation 737s –the 737-600, 737-700, 737-800 and 737-900.

12. BOEING brags on its website that BOEING (not the FAA which BOEING did not mention) "Certified and delivered the first three Next Generation models in less than one year."

13. Thus, long before the 737-8 MAX models were rolling off the assembly line, BOEING had developed the same scheme which was used on the 737 MAX 8 – race the new models through design, engineering, development and production by "cutting and pasting" prior models and prior documentation, knowing BOEING would be permitted by the FAA to self-certify. By introducing new models under the old type certification, despite many changes having been made to each subsequent 737 model, and tacking the subsequent models' certification onto the original Type Certificate, BOEING saved time and money. By not going through a new type certification process regardless of the number of changes made to the 737 and its documentation with each successive model BOEING could largely self-certify pieced-together and modified models and documentation and get the new model aircraft on the market as soon as possible, all based on the 1967 type certificate.

14. In 1967 when the 737 was type certified other than the "whiz rule" circular slide rule used for pre-flight planning, computers were largely non-existent.

15. The National Aeronautics and Space Administration (NASA) credits itself with the first fly-by wire aircraft, meaning an aircraft equipped with a computer to stabilize an

unstable airplane, namely the Space Shuttle Orbiter, followed by the military B-2, the Airbus A-320 and the BOEING B-777.

16. NASA also credits itself with the birth of the digital flight computer on May 25, 1972, half a decade after the Type Certification of the 737.

17. Thus, when the 737 was type certified, the ability of a plane's computer to over-ride the pilot was not possible and not imagined since that time myriad changes have been tacked on that certificate, the 737, and the manuals and other BOEING 737 instructional materials.

BOEING HAS LONG SELF INSPECTED AND SELF-CERTIFIED

18. The statement on BOEING's website referencing BOEING's own "certification" of its own models (Complaint, paragraph 12) is true, except a mis-characterization. BOEING did not type certify anew any 737 after the original type certification. BOEING used the 1967 certifications with hundreds of subsequent amendments and the FAA has largely and officially deferred to BOEING, permitting BOEING to self-inspect, self-approve, and self-"certify" BOEING aircraft modifications and new aircraft models.

19. This BOEING self-certification was permitted pursuant to the FAA Program called Organization Designation Authorization (ODA).

20. The ODA program intended that BOEING would have at least some FAA oversight.

21. But BOEING did not have any real FAA oversight under the ODA program.

22. In an official government report, The Office of the Inspector General of the U.S. Department of Transportation (OIG), which has audit and investigation oversight over the FAA, revealed BOEING conducted 90% of its own inspections and the FAA had not as of 2015, included BOEING in the FAA oversight program.

23. A 1993 report by the Government Accountability Office (GAO) warned BOEING self-certified 95% of the BOEING 747-400.

24. The OIG found BOEING self-certified 95% of the BOEING 777.

25. A 2005 report also by the GAO found the FAA had no requirements for evaluating the BOEING designated certification examiners.

26. Thus the computers, computer laws and computer pilot overrides of the 737 MAX 8 were not part of the type certification of a 737, but were amendments to the type certification reflecting subsequent modifications tacked on the type certification, year after year, change after change.

737's WERE ALSO MAKING UNCOMMANDED AND DEADLY NOSE-DIVES IN THE 1990s

27. BOEING had problems with the 737 nose-diving and killing plane loads of people long before 2018-2019 737 MAX 8 crashes. In 1991 to 1994, 737's were also diving themselves into the ground. The National Transportation Safety Board (NTSB) could not figure out why, but BOEING knew why and did not reveal what it knew about the defects in the plane until after more than one 737 dove itself into the ground. The problem with the 737 was not revealed after the first nose dive in 1991, but only after a second 737 nose-dived into the ground in 1994. The 737 was diving into the ground, uncommanded by pilots and impossible for pilots to stop. But to avoid grounding of the 737 aircraft BOEING did not reveal information it knew about the 1990s deadly nose-dives.

28. Those 737 crashes were caused by what came to be known as a "rudder hard-over", which was a single point of failure risk of the 1990s 737 aircraft design, with no redundancy, just as the Single Angle of Attack (AOA) indicator and the Maneuvering

Characteristics Augmentation System (MCAS) are a single point of failure risk on the 737 MAX 8.

29. BOEING now is repeating its 1990s conduct, pronouncing the 737 safe, refusing to ground the model, and concealing problems. BOEING is responding to the 737 MAX 8 disasters just as it responded decades earlier when 737s were previously falling out of the sky. BOEING continued its deadly strategy of denial and deflection even after the Lion Air 737 MAX 8 crash in October 2018, which was caused by a single point failure risk without redundancy, just as BOEING engaged in a denial and deflection strategy after the 1991 nose dive. BOEING's concealment of dangerous and deadly defects including from the FAA, airlines, pilots, passengers and the public on the 737 MAX 8 model after the Lion Air crash caused and contributed to the second deadly crash that of Ethiopian Airlines Flight 302, just as BOEING's behavior caused and contributed to a second deadly crash in 1994.

30. The similarity between BOEING's behavior after the 1990s rudder hard-over crashes and the MCAS nose-down dive crashes in 2018 and 2019, show BOEING deployed a common and continuous scheme after both series of crashes to conceal deadly faults in the aircraft that caused the planes, without pilot input or ability to overcome the aircraft, to dive into the ground killing all aboard.

31. In the 1990's the 737 was the only commercial jet in the U.S.A. with one power control unit (PCU) system and a single rudder panel which could put the plane in a deadly dive. Other commercial aircraft had two or more power control systems which provided a back-up system redundancy.

32. Today 737 MAX 8 is also the only major commercial passenger jet on which a single AOA indicator can put the aircraft in un-recoverable uncommanded nose-down dive.

33. The 1991 uncommanded nose-dive crash was of United Flight 585, which crashed near Colorado Springs, Colorado, killing all on board. The NTSB found BOEING had knowledge of many other similar 737 rudder incidents before the crash of Flight 585. Pilots had reported problems to the same NASA data base that 737 MAX 8 pilots had reported problems before the crash of Lion Air and Ethiopian Airlines, and in the 1980's – 1990's BOEING then, just as now did not act on the reports.

34. Instead, BOEING held what became known as its secret and infamous "We Have a Problem" meeting on October 8, 1992. See Appendix I, incorporated herein by reference.

35. After the first crash of the 737 because of an uncommanded nose-dive, BOEING secretly met and admitted it had a problem, but somehow BOEING already knew they could get away with not grounding the plane. BOEING knew BOEING would not do it and BOEING also was somehow confident or already had been advised the FAA would not do it.

36. In the "We Have a Problem" meeting BOEING admitted its 737 did not meet the "fail safe design intent".

37. BOEING devised options designed to spread costs out over a number of years rather than immediately fix the deadly problem.

38. BOEING despite knowing of the deadly problem that had already taken the lives of one plane load of people, considered taking no action, and also considered actions taking to 2-7 years.

39. Publicly the FAA and BOEING continued to blame Rocky Mountain winds called "rotors" and the pilots, just as after Lion Air BOEING and the FAA blamed the pilots and maintenance.

40. However the National Transportation Safety Board discovered that there were other pilot safety reports, (just as the media discovered there were many other pilot safety reports filed before the crash of Lion Air and Ethiopian Airlines Flight 302), made to the NASA safety database and to BOEING.

41. The NTSB wrote to the FAA, which was parroting BOEING in blaming the wind and pilots, informing the FAA of its discoveries about the pre-existing pilot complaints. See Appendix 2, incorporated herein by reference. But with both BOEING and the FAA blaming the wind and the pilots, the NTSB issued its first erroneous report blaming the wind – a report the NTSB would later have to change to properly blame the 737 itself for the uncommanded maneuvers.

42. A 1969 BOEING service memo cited reports of rudders moving inadvertently and during the 1970s – 1980s hundreds of pilots filed reports of rudder problems – all years before the crashes.

43. Finally in 1994 in response to the NTSB, the FAA adopted less costly options developed by BOEING at the "We Have a Problem" secret meeting and spreading any repairs over months, years or never. Neither the FAA or BOEING sought to ground the plane, a decision which all too soon would prove deadly.

44. Thereafter on September 8, 1994, in calm skies with little wind, and certainly no "rotors", a 737 dove into the ground, killing all onboard. BOEING and the FAA blamed the pilots and again would not ground the plane.

45. After the second deadly crash caused by a 737 throwing itself into a deadly nose dive, the NTSB recommended design changes in the BOEING 737 to eliminate the single-point failure in the 737, which the pilots could not counteract.

46. BOEING refused and instead recommended airlines teach their 737 pilots special aerobatic maneuvers to counter inadvertent rudder deflections that could put the 737 into a deadly dive, just as after the crash of Lion Air BOEING told airlines to have their pilots trouble shoot the problem and remedy the situation through pilot maneuvers.

47. The FAA endorsed the BOEING idea of acrobatic training instead of fixing the plane to prevent deadly uncommanded dives.

48. The FAA Director of Aircraft Certification, identified herein only as TM, refused to mandate additional pilot training despite the fact that uncommanded rudder deflection at low altitude, even with aerobatic training, would leave pilots only a few seconds to make precisely the right moves to save the diving aircraft. BOEING and the FAA claimed pilots should be able to save the plane from the deadly uncommanded dive, just as now BOEING and the FAA are claiming pilots should have been able to save the 737 MAX 8.

49. Therefore, despite the series of 737 uncommanded deadly dives in the 1990s, BOEING got away with its cost saving strategy. Although there was a public outcry for a better informed probe of the more exacting 737 rudder hard-over crashes, to be conducted by a fresh team of investigators, it never happened.

50. TM and the FAA concurred with BOEING in insisting there was no problem, but the public would never know. TM and the FAA ruled neither BOEING's analysis nor the FAA's conclusions would be made public because they include proprietary material that could hurt BOEING competitively in its race against Airbus.

51. Airlines were given years to fix the problems, if ever. Many problematic 737 models were phased out of service with newer 737s sold to them by BOEING.

52. The NTSB wanted a cockpit gauge to warn pilots. BOEING said newer models would be designed to limit the deflection, just as BOEING now says the 737 MAX 8 will be re-programmed to limit the nose dive deflection and cockpit displays will reveal when the MCAS presents a problem.

53. By 1998 the 737 was again in trouble, a 737 nose-dived and crashed in Indonesia. There were irregularities in the production of the 737. BOEING had to temporarily shut down its 737 production lines because of improper activities.

54. TM, Director of FAA Aircraft Certification once again allowed BOEING to fix its own problems.

55. BOEING and others blamed the 1997 Indonesia 737 crash on the pilots, but a U.S. trial concluded otherwise and found that once again the 737 dove itself into the ground.

THE FAA DOES NOT POLICE BOEING

56. The FAA has long permitted BOEING to self-certify most of its planes and production and made it abundantly clear the FAA did little concerning BOEING aircraft. For example the FAA's Seattle Aircraft Certification Office which also nominally has oversight over the 737 program was asked who should run the safety test program for the BOEING 777, stated:

> "It's their program, I didn't spend a dime on it."

57. BOEING warned the FAA against inspecting the 777:

> Indeed throughout the 777 testing program, Boeing repeatedly warned the FAA against delays. One 1991 letter, obtained under the Freedom of Information Act and written by Boeing's John Miller, chief engineer on the program, argued against an FAA request to audit what it considered "critical" software.
>
> This "would have a major impact on the work schedule," Miller wrote, adding that such audits "could even delay the program." The FAA and Boeing refused to say how the conflict was resolved, but it is clear from numerous such exchanges that the certification schedule and much of its content was dictated

by Boeing. Boeing routinely reminded the FAA that technical documents submitted for review "should be returned to Boeing immediately following use by the FAA … Boeing does not authorize the FAA to retain any portion of the materials being supplied."

Even most safety-test data is kept by Boeing. FAA inspectors must request it for review.

The best thing the (FAA) does in certification is stay out of the way of the manufacturers, who control the process from beginning to end.

You can't look at it, you can't feel it; it's collections of ones and zeros and there's no way you can test it, in and of itself, and be sure that it's good," one engineer said.

When software fails, nothing breaks, there's no visible evidence, its just zeros and ones diving invisibly off the ends of connector pins. Judging the reliability of such systems requires specific expertise and intimate knowledge of how they are designed and built.

Yet GAO investigators have determined the more complex the task, the more likely the FAA is to let the manufacturer judge it. A 1993 internal FAA study said the agency's engineers did not understand the complex flight-management system on the 747-400 and had delegated oversight of it and 10 other systems entirely to Boeing employees. The study said FAA staff "were not sufficiently familiar with the system to provide meaningful inputs to the testing requirements or to verify compliance with the regulatory standards."

This was at the absolute edge of responsible use of the designee system, the FAA study said. In reviewing this, the GAO concluded delegation (to Boeing) has since increased; if there was an edge, the FAA had gone over it.

The FAA does not keep records that identify who did what in the testing and certification process. Test reports, even the test schedule, are treated as trade secrets by Boeing and so are unavailable for any public review. But it is clear that an overwhelming majority of safety tests on the 777 were conducted by Boeing employees under supervision of other Boeing employees designated to act as FAA agents. Most of the work of these designees is only loosely supervised. Most test reports are not even glanced at (by the FAA).

Do you need all test results for all the systems in your area of responsibility, an FAA avionics specialist was asked?

"Impossible," he said. "The ones that pass (by Boeing) we don't even look at; they're fine. That means we trust that the work was done as expected."

> In summary, Boeing designed the airplane, wrote the plan to test the design, executed it, and largely affirmed that it had been executed.
>
> TM, director of the FAA's Aircraft Certification Service said, when asked what contribution the FAA makes to safety. "We ought to start with asking ourselves if we (the FAA) should even exist."
>
> "While we (the FAA) don't impact the biggies like Boeing and Douglas, Piper and Beech and some of those, well, we don't really impact what they do a lot because they're going to do a lot of that stuff whether we're here or not, with liability and everything else."

Selected excerpts, emphasis added, See The Seattle Times, June 4, 1995, http:/www.community.seattletimes.nwsource.com/archive/?date=19950604+slug=2124639

58. Thus the FAA decided to leave accountability and oversight to private liability lawsuits, and design, testing, inspection and certification to BOEING.

59. TM of the FAA later joined BOEING as BOEING director of international safety and regulatory affairs.

60. But BOEING's goal in hiring TM of the FAA was apparently not to improve its safety internationally, instead:

> "TM said Boeing offered him more money while allowing him to remain in the Washington D.C. area."

http://www.aironline.com/aviation-news/2007-10-09/former-faa-staffer-joins-boeing

61. Common sense, as well as federal safety regulations, suggest it is not possible to direct international safety of BOEING, manufacturing commercial aircraft in the State of Washington and the State of South Carolina, and selling to operators around the world including to Ethiopian Airlines, without leaving the well paid confines of Washington, D.C.

WHAT WAS DIFFERENT IN 2019 TO CAUSE THE GROUNDING OF THE 737

62. When two 737's crashed within 5 months of each other in 2018 and 2019, something had changed from the multiple 737 nose dive crashes in the 1990s – in the 2018-2019

crashes were not in the U.S.A. and non-U.S. regulators (not the FAA) questioned the certification and airworthiness of the 737 MAX 8. Non U.S. regulators did not accept BOEING's word on the safety of the plane, and non-U.S. safety organizations grounded the plane. Non-U.S. regulators, unlike the FAA, refused to simply blame pilots when two 737s went into a deadly uncommanded nosedive giving the pilots an impossible task and only seconds to counteract a deadly situation, a situation on which they were not informed or trained.

63. China, Canada, and nations in Europe, Africa and Asia grounded the 737 MAX 8 which BOEING and/or the FAA should have done after Lion Air crash. Instead BOEING continued to insist even after the crash of Ethiopian Airlines Flight 302 that the plane was safe which the FAA parroted, just as the FAA has done since the earlier 737 uncommanded deadly dives.

64. The crash of Ethiopian Airlines Flight 302 was caused by and is the fault of BOEING. BOEING defectively designed, engineered, installed, tested and marketed an aircraft, training, manuals and other components, and of course a flight control system for the BOEING 737 MAX 8 which without pilot command, automatically and erroneously, could and did force this and other 737 MAX 8 aircraft into a nose down dive, crash and death for all on board.

65. BOEING also failed to warn, failed to properly design, failed to provide accurate training and other manuals, and other required information and guidance for the 737 MAX 8. BOEING's conduct was egregious, outrageous, intentional and willful and was the direct cause of this crash and loss of life which otherwise would not have occurred. Ongoing federal and criminal investigations suggest there is reasonable cause to believe BOEING's behavior was also criminal.

JURISDICTION & VENUE

66. Various treaties may apply to the international carriage of persons, baggage or cargo performed by airlines pursuant to a contract of carriage, including carriage to be performed by successive carriers. *See* Convention for the Unification of Certain Rules for International Carriage by Air Montreal, 28 May 1998, ICAO Doc. 9740 (Montreal Convention). But, said treaties including the Montreal Convention do not apply BOEING.

67. The Plaintiffs' Administrator is a citizen of the United States and a resident of Charleston, South Carolina.

68. Plaintiffs' Decedent was a citizen and resident of Sweden. He leaves four children, one of whom is a minor, all of whom are residents of Sweden. He also leaves a dependent mother and other next of kin.

69. BOEING is, and has at all times relevant and herein, been a citizen of, resident in, and at home in the State of South Carolina. BOEING is at home in the State of South Carolina, because BOEING has its second largest commercial aircraft manufacturing and work facility in South Carolina. Further documenting its home and residence in South Carolina, BOEING received approximately $900 million in South Carolina tax cut, rebates, benefits and other incentives from the State of South Carolina to reside in South Carolina. At all relevant times, BOEING has been authorized to do business, and has been transacting or conducting substantial business activity, in the State of South Carolina by assembling and/or manufacturing hundreds of aircraft in South Carolina and receiving hundreds of millions dollars from the State of South Carolina to which BOEING represents BOEING resides in South Carolina and intends to continue to reside in South Carolina. BOEING is a Delaware corporation, with its corporate offices in Chicago, Illinois, major commercial passenger aircraft manufacturing facilities in the

State of Washington and the State of South Carolina and major Defense, Satellite and other manufacturing facilities in the State of California.

70. Therefore general jurisdiction exists over BOEING in this district because BOEING is at home in this district.

71. Venue is proper in this District because BOEING resides in North Charleston, South Carolina, and BOEING has offices in this District, and at all relevant times conducted business herein.

72. Because more than 75 persons died at the same location as a result of the crash, pursuant to the Multi-Forum Multi-Jurisdiction Act, 28 U.S.C. § 1369, the U.S. Federal District Courts shall have original jurisdiction of any civil action involving minimal diversity between adverse parties that arise from a single accident.

73 The U.S. District Court also has original jurisdiction pursuant to 28 U.S.C. § 1332 as the amount in controversy exceeds, and greatly exceeds, the sum or value of $75,000.00 exclusive of interest and costs and this action is between citizens of a state and a foreign state.

74. The U.S. District Court also has original jurisdiction under 28 U.S.C. § 1331 as federal questions of U.S. laws are at issue herein.

THE PARTIES

75. At all times relevant hereto, the Plaintiffs' Administrator is a citizen of the United States and a resident of the State of South Carolina.

76. At all relevant times, Plaintiffs' Decedent George K. Thugge was a citizen of Sweden and a resident of Sweden, as are his four children. His dependent mother and other next of kin reside in other nations and jurisdictions.

77. The Defendant, BOEING is a corporation that is at home in, resides in, and has a principle place of business in North Charleston, South Carolina.

78. At all relevant times, BOEING was engaged in the business of designing, manufacturing, assembling, modifying, maintaining, inspecting, testing, servicing, marketing, training, advertising, and distributing aircraft including this subject aircraft and their component parts, including but not limited to the subject aircraft, its software, its manuals, its training, and other required information and materials.

FACTS

79. This action arises out of the crash of Ethiopian Airlines Flight 302 (referred to herein as "Flight 302", the "subject crash" and the "subject aircraft") on March 10, 2019. Mr. Thugge was a passenger on the flight and was killed in the crash. In total, 157 people died. None of the passengers, including Mr. Thugge, did anything to cause, or contribute to causing, this crash and the loss of 157 lives.

80. The aircraft in Flight 302 the subject aircraft, was a BOEING 737 MAX 8. The Flight 302 crash was the second fatal crash of a BOEING 737 MAX 8 in less than five months. The prior crash of a 737 MAX 8 was the crash of Lion Air Flight 610 which crashed into the Java Sea on October 29, 2018, killing all 189 onboard that flight. Lion Air 610 was also a BOEING 737 MAX 8.

81. Flight 302 was intended to be an international flight from Addis Ababa, Ethiopia Bole International Airport (ADD) to Nairobi, Kenya Jomo Kenyatta International Airport (NBO).

82. Mr. Thugge was connected onto the flight via international round trip ticketing departing from and returning to Stockholm, Sweden Arlanda Airport (ARN).

83. Prior to the crash of Flight 302, BOEING in the United States of America designed, manufactured, assembled, and sold the Flight 302 aircraft and its component parts and prepared and provided manuals, training and other materials and information for the subject aircraft. BOEING performed these activities in the United States of America.

BOEING SOLD AND/OR DELIVERED THE SUBJECT AIRCRAFT TO EHTIOPIAN AIRLINES AFTER THE CRASH OF THE LION AIR 737 MAX 8

84. While the FAA nominally approved the certification of the 737, and the production of this 737 MAX 8 model aircraft, and documents on file with the U.S. Federal Government state the FAA approved the aircraft, investigators of the U.S. Department of Transportation Office of Inspector General (OIG) found that public law 49 U.S.C. § 44702(a) allowed the FAA to delegate certain functions, such as approving new aircraft designs and certifying aircraft components, to private individuals or organizations, and that one aircraft manufacturer approved about 90 percent of the designs for all its own aircraft. *See* FAA Lacks An Effective Staffing Model and Risk – Based Oversight Process for Organization Designation Authorization, Federal Aviation Administration, Office of Inspector General Report AV:2016-001 accessed at http://www.oig.dot.gov. On information and belief that aircraft manufacturer which the official U.S. government report states is permitted to self-certify 90% of its own aircraft is BOEING.

85. As of 2016, the FAA had not staffed to include BOEING in FAA oversight, effectively leaving BOEING to self-certify:

> Finally, the largest ODA oversight office – which is dedicated to Boeing and encompasses about 40 staff—is not currently included in FAA's staffing model. A key FAA manager responsible for developing the Agency's aviation safety budget requests told us that FAA did not include this office initially because Boeing is a large and unique organization, and the Agency wanted to improve other parts of the model before adding it. FAA expects to add this office to the model by October 2015 and have an initial forecast

> available by fiscal year 2016. Until then, FAA does not know whether it has adequate staffing levels needed to meet workload requirements at the largest ODA oversight office or how the inclusion of its largest office will impact overall staffing numbers.

See Report AV-2016-001 at page 5.

Furthermore,

> FAA only performed oversight of 4 percent of these company personnel who perform work on FAA's behalf, exclusively at domestic locations. This leaves a critical portion of ODA work without FAA oversight.

Id., at page 10.

BOEING was one of the companies specifically examined in the OIG investigation. Id. at page 17.

86. Therefore, the FAA effectively delegated to BOEING the approval of the system safety analysis of the 737 MAX 8, the modifications from the prior 737 models to the MAX 8, the MCAS system, the manuals, the training and other related 737 MAX 8 issues.

87. At all times herein, BOEING falsely represented that the subject aircraft, its training and manuals, and all related goods and services are airworthy, safe, reliable, and fit for the intended purposes.

88 On or about November 15, 2018, BOEING delivered the newly manufactured Flight 302 aircraft to Ethiopian Airlines with full awareness that it would be used by said airline for commercial operations carrying hundreds of passengers, and the subject flight was one such flight.

89. BOEING delivered the Flight 302 aircraft after Lion Air had crashed, and after BOEING had knowledge of problems with the MCAS systems and after BOEING had knowledge of the defects in the 737 MAX 8 and could have elected to ground the 737 MAX 8. This fact was confirmed by the FAA on May 15, 2019, under oath, in hearings before the U.S. Congress.

90. The Flight 302 aircraft was sold and delivered by BOEING without alteration or substantial change by another party, was being used by Ethiopian Airlines as an intended user in an intended purpose and in a manner reasonably foreseeable to BOEING.

91. Within the airline manufacturing industry, there exists a global duopoly and a global competition for market share and profits between BOEING and Airbus, with the two companies capturing 99% of the world's commercial jet orders.

92. In or around 2011, BOEING faced a serious business and profitability challenge when some of its most important customers, including American Airlines, planned to order the Airbus A320neo, a new airplane model that Airbus advertised as "the world's most advanced and fuel-efficient single-aisle aircraft."

93. The 737 is a single-aisle aircraft.

94. BOEING stood to lose a tremendous amount of money and market share to Airbus if BOEING fell behind Airbus in the production of fuel-efficient airplanes to offer to BOEING customers.

95. BOEING decided it would take too long to design, test, certify and produce a new airplane to compete with the Airbus A320neo. Instead BOEING made the soon-to-be-deadly decision to use its existing 737 model, the 737NG, as the basis for what would become the Boeing 737 MAX 8.

96. In August of 2011, BOEING's leadership, management and Board of Directors approved the Boeing 737 MAX program.

97. BOEING's decision, made at the highest levels of the company, to use the existing design of the Boeing 737NG rather than design, test, certify and produce an entirely new

airplane, was made to shortcut regulatory scrutiny of a new type certified aircraft and increase BOEING's profits, because:

a. Using the existing type certification and design saved BOEING significant design and development costs;

b. Using the existing type certification and design permitted BOEING to rush the design, production and manufacture of the Boeing 737 MAX 8 and get it to market quickly so that BOEING would not lose business and profits to Airbus;

c. Using the existing design permitted BOEING to offer the Boeing 737 MAX 8 to its customers, including Ethiopian Airlines, with the marketing and representations that pilots already qualified to fly the Boeing 737NG could move to the Boeing 737 MAX 8 without undergoing any meaningful transition training, and without needing to be trained and tested in flight simulators and/or in the airplane before flying revenue (passenger carrying) flights;

d. Using the existing type certification and design permitted BOEING to use its Organization Designation Authorization (ODA), granted to it by the FAA, to streamline and speed the certification, and largely self-certify, the Boeing 737 MAX 8 with amendments to the Boeing 737 type certificate; and

e. Using the existing design permitted BOEING to produce an updated, fuel-efficient airplane to compete with the Airbus A320neo more quickly and cost effectively than if BOEING had developed a new type or model airplane.

98. In designing the 737 MAX 8, BOEING made multiple modifications and updates to the structure and flight control systems of the 737NG.

99. As part of the modifications, BOEING replaced the CFM56-7 engines used in the Boeing 737NG with larger, more fuel-efficient CFM LEAP-1B engines.

100. Because the CFM LEAP-1B engines were substantially larger than the CFM56-7 engines, BOEING had to mount the engines higher and farther forward on the 737-8 MAX's wings and modify the airplane's nose gear to provide more ground clearance for the new, bigger engines.

101. The increased power and new location of the CFM LEAP-I B engines gave the Boeing 737 MAX 8 a propensity to abnormally pitch up under certain flight parameters, creating a risk that the airplane would suffer an aerodynamic stall and crash.

102. This pitching up of the 737 MAX 8 demonstrated the changes made to the 737 MAX 8 changed its weight and balance, center of gravity, aircraft stability and flight characteristics, simply put, the aircraft would fly and feel differently to 737 pilots accustomed to other 737 aircraft.

103. Furthermore, that pitching up made the aircraft unairworthy. Pursuant to the FAA's Airworthiness Standards for Commercial Aircraft': "No abnormal nose-up pitching may occur.... In addition, it must be possible to promptly prevent stalling and to recover from a stall by normal use of the controls."

104. Despite knowing that the Boeing 737 MAX 8 had aerodynamic handling defects, BOEING pressed on with the development of the airplane and created the MCAS to mitigate the risk of potential aerodynamic stalls and to force the 737 MAX 8 to handle, fly and feel to pilots more like the Boeing 737NG. However, the MCAS failed to mitigate such a risk and on or before March 10, 2019, BOEING knew and/or should have known of that failure, but BOEING did not take the reasonable and necessary action, thereby putting the subject aircraft, the subject flight, and the flying public at risk including the Decedent. Such acts and omissions demonstrate BOEING's reckless disregard and conscious indifference for the safety of the flying public, including the Decedent.

105. The MCAS is a flight control computer code managed by the BOEING 737 MAX 8's Flight Control Computer. BOEING designed and installed the MCAS in the BOEING 737 MAX 8 in order to address the above-described aerodynamic handling defects.

106. BOEING has claimed that it added the MCAS to the Boeing 737 MAX 8 to give the airplane the same "feel" to pilots during manual flight as the BOEING 737NG, but in fact it was an attempt to make the plane airworthy.

107. The MCAS commands nose down trim when the active Flight Control Computer receives data from one of the airplane's AOA sensors or indicators that the aircraft's nose has pitched above a threshold level. As it turned out, only one of the indicators fed input to the MCAS.

108. The AOA sensors, mounted on the left and right sides of the nose of the BOEING 737 MAX 8, are intended to measure the angle between the airplane's wings and oncoming airflow for purposes of detecting the risk of aerodynamic stall.

109. BOEING intentionally designed the MCAS to take data from one of the 737 MAX 8's two angle of attack (AOA) sensors and to alternate the sensor from which it accepts data each flight.

110. BOEING has not publicly disclosed why it decided to have the MCAS take data from only one indicator.

111. BOEING in its design, manufacture, production, and assembly of the 737 MAX 8 used approximately 900 suppliers in the manufacturer and assembly of the 737 MAX 8. The MCAS software was designed by BOEING, but the lines of code in developing the system and the physical components were programmed and built to BOEING's specifications by another company, Rockwell Collins, now called Collins Aerospace, located in Iowa and Florida among other places. The angle of attack sensor was made by Rosemount Aerospace, located in Minnesota.

112. Both Rockwell Collins (Collins Aerospace) and Rosemount are owned by United Technologies Corporation located in Connecticut, among other places.

113. Even though Rockwell Collins (Collins Aerospace) built the 737 MAX 8 flight control computer and the software and coding that runs the MCAS, and Rosemount manufactured and supplied

the Angle of Attack indicators, BOEING remains responsible for its suppliers and contractors, and for the design, production, manufacture, certification and airworthiness of its BOEING aircraft.

114. Rockwell Collins which produced the flight controls computers and software on the 737 MAX 8 also provided software updates to BOEING after the crash of Lion Air in 2018, but BOEING had not taken the necessary action to make all changes needed on 737 MAX 8 and the subject aircraft before the crash of Ethiopian Airlines Flight 302.

115. Pitch control in the BOEING 737 MAX 8 is controlled by hydraulically-powered elevators and an electrically-powered horizontal stabilizer in the airplane's tail which the MCAS could command.

116. The BOEING 737 MAX 8's elevators are controlled by forward and aft movement of the pilots' control columns or yokes which a layperson may think of as a "steering wheel" in the cockpit.

117. Movement of the BOEING 737 MAX 8's horizontal stabilizer can be controlled automatically, through autopilot, or MCAS-commanded automatic trim inputs which drive a single electric trim motor.

118. Horizontal stabilizer movement in the BOEING 737 MAX 8 is also supposed to be able to be controlled manually by the pilots by engaging the pitch trim switches on the pilots' yokes, which drive the electric trim motor, or by rotating the airplane's pitch trim wheel.

119. However, BOEING also made changes to the two toggle switches that can immediately shut off power to the MCAS commands. BOEING changed the labeling and function of the cut-off switches. Before the changes, the left switch deactivated the pilot switches on the pilots' yokes with which pilots could control the horizontal stabilizer, and the right switch deactivated only the automated functions. But on the 737 MAX 8 BOEING made both switches do the same thing – both turn off all electric controls of the stabilizer leaving the pilots without electric controls on the yoke to counteract

the uncommanded nose down. A human body, or even two human bodies, does not have enough physical strength to manually counteract a full nose down trim and pull the plane back up.

120. Thus, the MCAS commanded trim inputs in the BOEING 737 MAX 8 which turned a jack screw in the airplane's tail and on this flight moved the leading edge of the horizontal stabilizer and forced the nose down. But without the electric trim buttons or the yoke (because the toggle switches turned them off), 737 MAX 8 pilots would have struggled in vain to countermand an MCAS-commanded nose down input. The pilots would have found the yoke-mounted electric pitch trim switches did not trim the nose back up, and the airplane's MCAS continued to reset, reactivate and again push the nose down, potentially many times.

121. In addition to the defects in the changes to the switch functions, the design decision by BOEING to have MCAS reset and reactivate after a pilot has tried to countermand an MCAS nose down input, created the danger that MCAS would fight against the efforts of pilots trying to save airplanes from crashing, which the MCAS did on the subject flight.

122. The MCAS will continue to command the electric trim to push the nose down even if the pilots are desperately manually pulling back on the airplane's yokes to pull the airplane's nose back up because BOEING also intentionally designed the system so that it would not disengage when pilots pulled back on their yokes.

123. The MCAS will continue to command the electric trim to push the nose down even if an airplane is dangerously low and at risk of crashing because BOEING intentionally designed the system so that it did not consider an airplane's altitude or proximity to terrain in its programing. This design decision caused MCAS to continue to trim Flight 302's nose down when the plane was at low altitude, even soon after take-off, even in the critical climb out stage or the flight.

124. Most likely the MCAS engaged as soon as the pilot retracted the flaps after takeoff, a very dangerous time to push the nose down.

125. BOEING did not design and install in the BOEING 737 MAX 8 an automatic ground collision avoidance system, leaving the airplane without an automatic safeguard that would have protected it from MCAS-created emergencies that put the airplane in danger of crashing.

126. BOEING designed the MCAS so that the system did not consider, and/or disregarded, the BOEING 737 MAX 8's airspeed deciding whether to automatically trim the airplane's nose down. This design decision caused the MCAS to trim the subject aircraft's nose down even when the airspeed indicated that the airplane was not at risk of stall, and at airspeeds that made manual recovery of the airplane overly difficult or impossible.

127. And as mentioned above, the 737 MAX 8 has cut off switches, a STAB TRIM PRI cutout switch and a STAB TRIM B/U cutout switch, both located on the cockpit's control stand. If either of these switches are positioned to CUTOFF, the autopilot, MCAS, and manual electric trim inputs are disconnected from the stabilizer electric trim motor and the pilots yokes.

128. The MCAS design does not permit pilots to disengage the MCAS; the only way that pilots can stop the MCAS from forcing the airplane's nose down is to disengage the airplane's electric trim. After disengaging the electric trim, however, the pilots would not be able to use the electric trim to control pitch, and would only be able to pull the nose of the airplane up by trying to pull back on the control yokes and attempting to turn the manual pitch trim wheel. Pilots did not have enough physical strength to overcome a full nose down trim and they did not have enough time to manually re-configure and manually trim-up the nose.

129. BOEING knew, or should have known as prior NTSB crash investigations have demonstrated, that after an MCAS-commanded nose down emergency the aerodynamic forces on the

horizontal stabilizer could be too great for pilots to control manually without the use of the electric trim. They would lose time and altitude in troubleshooting and re-configuring the plane.

130. BOEING should have provided Boeing 737 MAX 8 pilots with the ability to disengage a malfunctioning MCAS without losing their ability to control pitch with the airplane's electric pitch trim.

131. BOEING did not tell its customer airlines or pilots transitioning to the BOEING 737 MAX 8 that it had incorporated the MCAS into the airplane, or that the MCAS would automatically force the airplane's nose toward the ground if the selected AOA sensor "told" the system that the nose of the airplane was angled too high, even if the AOA sensor was malfunctioning when it gave the "too-high" message.

132. BOEING intentionally decided not to tell 737 MAX 8 operators and 737 MAX 8 pilots about the MCAS and not to tell them to undergo any MCAS training, since the MCAS was supposed to be an automatic system that required no pilot input to operate and BOEING did not want to tell airlines its pilots would need additional training. Therefore, BOEING kept concealed most if not all information about the MCAS.

133. BOEING also intentionally decided that pilots transitioning from the BOEING 737NG did not need to be trained in a simulator and/or in the airplane, and in particular did not need simulator training or testing on how to handle emergencies caused by the airplane's MCAS.

134. As a result of BOEING's intentional and knowing decisions, the pilots of the subject aircraft had not received any simulator training or testing on how to handle emergencies caused by the BOEING 737 MAX 8 airplane's MCAS.

135. BOEING knowingly failed to conduct a proper failure modes and effect analysis during development of the BOEING 737-8 MAX to ensure that the airplane's MCAS was safe.

136. BOEING failed to properly consider the likelihood that BOEING 737 MAX 8 AOA sensors (or the one feeding information to the MCAS) may fail and mistakenly trigger the MCAS to push 737 MAX 8 airplanes into a dive.

137. BOEING did not sufficiently test the Boeing 737-8 MAX's MCAS during development to ensure that the automated system would not create a safety of flight problem if it were to receive erroneous data from one of the airplane's AOA sensors.

138. The MCAS was essential to BOEING's business and profit plan to quickly manufacturer and sell the BOEING 737 MAX 8, because the airplane could not otherwise appear certifiable to the FAA without the MCAS, and indeed the plane was not certifiable without the MCAS because of the tendency of the plane to pitch nose up.

139. In BOEING's rush to get the 737 MAX 8 to market, BOEING knowingly, intentionally, wantonly, callously, egregiously, negligently and possibly criminally, compromised and endangered the safety of BOEING 737 MAX 8 crews and passengers, and killed two plane loads of people.

BOEING DECEIVED THE FAA AND PURCHASERS OF THE BOEING 737-8 MAX BY ASSERTING THAT CRITICAL SAFETY FEATURES NEED NOT BE STANDARD, OFFERING THEM ONLY AS OPTIONAL EQUIPMENT AT EXTRA COST

140. Evidence that BOEING put its profits ahead of safety in its design, production, assembly, manufacture and marketing of the BOEING 737 MAX 8 airplane includes that BOEING charged its customers extra for the installation of important safety features.

141. In marketing the BOEING 737 MAX 8 airplane to potential owners and operators, BOEING offered a number of optional for-purchase safety upgrades.

142. One of those upgrades, the Angle of Attack Indicator, if purchased and installed, would instantly display to the pilots the real-time data from both AOA sensors, providing valuable safety information to the pilots.

143. The information provided by the Angle of Attack Indicator, if purchased and installed, would assist pilots in diagnosing why a Boeing 737 MAX 8's MCAS was erroneously pushing the airplane down toward the ground.

144. BOEING did not offer the Angle of Attack Indicator as standard equipment in the BOEING 737 MAX 8 because is wanted to be able to offer the base airplane at a low price point in order to make it more competitive, while at the same time profiting on the sale of the optional safety feature.

145. BOEING (and the FAA nominally) permitted the BOEING 737 MAX 8 airplanes to be certified and sold without Angle of Attack Indicators, thus depriving flight crews of critical information and in doing so, exposed the passengers and crew of the subject aircraft to increased danger.

146. BOEING offered a second optional safety feature called the Disagree Light, which would activate if data from the BOEING 737 MAX 8's two AOA sensors data did not match.

147. The Disagree Light, if purchased and installed, would instantly show 737 MAX 8 pilots that one of the AOA sensors was malfunctioning, or at least that they were not providing comparable readings.

148. The Disagree Light, if purchased and installed, would assist 737 MAX 8 pilots in diagnosing why the airplane's MCAS was erroneously pushing the airplane's nose toward the ground.

149. The Disagree Light had been standard equipment on prior BOEING 737 models; BOEING could have made it active in every BOEING 737 MAX 8 airplane for little or no cost.

150. BOEING initially decided that the Disagree Light would be standard equipment in the BOEING 737 MAX 8, but then decided to make it active only for airlines who paid extra for the safety feature.

151. Ethiopian Airlines relied on BOEING's representations that the BOEING 737 MAX 8 airplane was safe and airworthy without the Angle of Attack Indicator or the Disagree Light when it purchased BOEING 737 MAX 8 airplanes, including the subject aircraft.

152. Ethiopian Airlines relied on BOEING's (and nominally the FAA's) certification of the BOEING 737 MAX 8 as airworthy without the incorporation of the optional safety features when it purchased BOEING 737 MAX 8 airplanes, including the subject aircraft, without those safety features.

153. BOEING abused the trust and authority intentionally delegated to it by the FAA when BOEING put its profits ahead of aviation safety during the compliance activities that resulted in the certification of the BOEING 737 MAX 8.

154. Through the life-span of the 737 program the FAA has increasingly trusted and relied on BOEING (and other aviation manufactures, but to the greatest degree on BOEING), to conduct the evaluation and testing that resulted in the certification of airplanes.

155. BOEING has so completely assumed the FAA certification process that an FAA airworthiness certification of an airplane or airplane system no longer means that the FAA independently considered and determined whether that airplane or airplane system was safe, but rather that BOEING has largely supplemented the role of the FAA. For example:

a. BOEING (and others in the aviation industry) successfully lobbied the FAA to deregulate and streamline the certification process;

b. BOEING (and others in the aviation industry) successfully lobbied against new rulemaking by the FAA;

c. BOEING (and others in the aviation industry) successfully lobbied the FAA to forgo enforcement actions or penalties for industry violations of federal safety regulations and orders in lieu of seeking voluntary compliance from the industry; and

d. BOEING (and others in the aviation industry) successfully lobbied the FAA to confer on aviation manufacturers what previously had been the FAA's responsibility: to review and approve new features on aircraft.

156. BOEING has spent a considerable amount of money lobbying the U.S. federal government; in 2018 it invested more than $15,000,000 into efforts to influence federal lawmaking and to push for less regulation and oversight.

157. The FAA's top leadership has been staffed with aviation industry insiders, including officials who previously worked for industry lobbying groups that have successfully advocated for reduced regulation and oversight of the very aviation manufacturers that these officials now must impartially regulate.

158. BOEING gives well paid positions to former FAA leadership including those who at least appear to have some BOEING interests when in the government.

159. FAA's leadership has openly acknowledged it defers almost entirely to BOEING, with key FAA members putting aviation industry interests ahead of aviation safety. For example:

a. The FAA sided with BOEING's financial interests over aviation safety in its certification of the BOEING 737 MAX 8;

b. The FAA sided with BOEING's financial interests over aviation safety in not grounding the BOEING 737 MAX 8 after the Lion Air crash;

c. The FAA continued to side with BOEING over aviation safety even after the Lion Air crash, with the U.S. being the last country to ground the BOEING 737 MAX 8; and

d. The FAA leadership continues to side with BOEING over aviation safety, as evidenced by the Acting FAA Administrator's March 27, 2019, testimony before the Senate Transportation Committee's Subcommittee on Aviation and Space, during which he downplayed the danger of MCAS and blamed the deceased pilots of the two crashed airplanes for not being able to save their airplanes and the lives of the passengers and crew, despite having actual and/or constructive knowledge to the contrary.

e. The FAA sided with BOEING at the May 15, 2019, House Committee on Transportation and Infrastructure Subcommittee on Aviation even while admitting BOEING withheld from the FAA information about the MCAS software anomaly.

160. BOEING (as well as others in the aviation industry) have repeatedly sought to reduce the federal regulatory burden on the industry; and to immunize the industry from liability for defects in airplanes that the FAA nominally has "certified," when, in fact, that certification largely has been outsourced by the FAA to the industry.

161. Aviation industry lobbying groups, including the Aerospace Industries Association of America, Inc., on whose Board BOEING CEO Dennis Muilenburg serves, including a term as Chairman in 2017, have recently filed amicus briefs in the U.S. Supreme Court seeking immunity for aviation manufacturers from potential products liability claims concerning airplanes or aviation products that have been "certified" by the FAA.

162. Since the FAA permits BOEING to self-certify Muilenburg's group's amicus brief was in effect seeking to BOEING the power to give itself legal immunity for the horrific loss of life BOEING has caused in plane crashes like the 737 MAX 8.

163. As discussed above, in 2005, the FAA adopted the ODA program that licensed BOEING to designate its own employees who would review and approve BOEING's designs on behalf of the FAA.

164. Under its ODA, BOEING had a duty of integrity in its dealings with the FAA. BOEING violated that duty by misrepresenting to the FAA that the Boeing 737 MAX 8 was safe to fly when BOEING knew that the airplane was not safe.

165. Under its ODA, BOEING had a duty to notify the FAA regarding any issue that might create an unsafe flight condition so that the FAA could investigate and remediate the issue. BOEING violated that duty when it did not reveal to the FAA (and its operators) about the instability of the 737 MAX 8 in pitching up, and the hazards of MCAS, among other defects, as confirmed on the record before the U.S. Congress on May 15, 2019, as set forth above.

166. Under its ODA, BOEING had a duty to use care, diligence, judgment and responsibility, and follow the Federal Aviation Regulations, when performing compliance activities. BOEING did not satisfy that duty and instead promoted its profits by rushing the certification of an unsafe airplane.

167. In 2012, the OIG reported the FAA was not backing its employees in their efforts to hold BOEING accountable and FAA safety inspectors feared retaliation for raising problems regarding BOEING's products or its actions.

168. As discussed above, in 2015, the OIG found the FAA lacked effective staffing and was not performing proper oversight of ODA manufacturers.

169. The improper relationship between the FAA and BOEING continues and existed on March 10, 2019, when the subject aircraft crashed. The OIG as well as the U.S. Department of Justice with the Federal Bureau of Investigation have launched audits and investigations of BOEING, the FAA, and the activities that lead to the certification of the BOEING 737 MAX 8.

170. BOEING took advantage of the FAA's abdication of its oversight responsibilities check on the safety of the BOEING 737 MAX 8 and BOEING praised the FAA's hands-off approach.

171. On a 2017 conference call with Wall Street investors, BOEING CEO Dennis Muilenburg praised the FAA's "streamlined" certification process that had helped BOEING bring new models, including the 737 MAX series of airplanes, quickly to market.

172. BOEING's Muilenburg complimented the government's "focus on deregulation and simplifying processes," for which BOEING was a "strong proponent."

173. BOEING's Muilenburg went on to compliment the FAA, "Things like FAA certification processes is one place that we're seeing some solid progress. That's helping us more efficiently work through certification on some of our new model aircraft such as the MAX as it's going through tests and entering into service".

174. The "streamlining" of the BOEING 737 MAX 8's certification process meant that BOEING was largely able to conduct the certification of its own airplane. The benefits were to BOEING' s profits, not to the safety of the 737 MAX 8.

175. The "streamlined" certification of the BOEING 737 MAX 8, which BOEING largely performed itself, allowed BOEING to sell the defective BOEING 737 MAX 8 airplane to airlines around the world and to date has caused the loss of at least two 737 MAX 8 airplanes and the deaths of 346 people.

176. On the day that Flight 302 crashed, 59 airlines worldwide were operating 357 BOEING 737 MAX 8 airplanes and BOEING had firm orders for over 5,000 more.

177. An untold number of passengers and crew members in the U.S., Ethiopia and around the world were put at risk because BOEING was permitted to sell a defective and unsafe airplane based on improper certification.

178. Utilizing its ODA, BOEING developed the Product Specific Certification Plan (PSCP) for the Boeing 737 MAX 8 that set forth the activities necessary to demonstrate to the FAA that the airplane met all federal design requirements.

179. BOEING's plan was to push for certification of the BOEING 737 MAX 8 as an amendment to the BOEING 737 type certificate because, if accepted as an amendment, it would limit review of the new design and speed its certification at the least cost to BOEING.

180. BOEING applied for an amended type certificate for the Boeing 737 MAX 8 in January of 2012.

181. The FAA, relying on BOEING's misrepresentations, determined within a month, in February of 2012 that the MAX project qualified as an amended type certificate and that its certification could be managed by Boeing under its ODA.

182. BOEING, by misusing the FAA ODA system, gained certification of the Boeing 737 MAX 8 in March of 2017.

183. The certification of the BOEING 737 MAX 8 was supposed to signify that the airplane met a "minimum level of safety" because its design complied with federal requirements.

184. The FAA relied on BOEING's representations that the BOEING 737 MAX 8 met the "minimum level of safety" and complied with all applicable federal requirements.

185. The Boeing 737 MAX 8, however, did not meet a "minimum level of safety" and should never have been certified.

186. As a new feature, the design and functioning of MCAS was required to be reviewed and approved by the FAA, but a meaningful review of MCAS was not completed during the compliance activities that preceded the certification of the BOEING 737 MAX 8 and was not completed even after the crash of Lion Air.

187. After initially retaining the direct authority to review the safety of MCAS because it was a new feature, the FAA ultimately released the MCAS safety review to BOEING under BOEING's ODA.

188. BOEING did not provide the FAA with sufficient information regarding the functioning of MCAS during the design review process that preceded the certification of the Boeing 737 MAX 8. In particular:

a. BOEING did not test for possibility of an AOA sensor failure causing MCAS-commanded nose down during any of the simulator or flight test evaluations of the BOEING 737-8 MAX conducted to support the airplane's certification;

b. The FAA did not require BOEING to test for the possibility of AOA sensor failure because BOEING violated its duty under the FAA ODA to inform the FAA that an AOA failure could create a handling emergency;

c. BOEING's safety analysis understated the authority (or power) of the MCAS to trim the horizontal stabilizer and force the airplane's nose down;

d. BOEING's safety analysis did not consider that MCAS would reset and continue to activate when pilots countermanded MCAS-commanded nose down trim by using manual electric trim to bring the nose back up, a design flaw that causes MCAS to fight against the pilots' attempts to bring the nose of the airplane up; and

e. BOEING's safety analysis determined that a failed AOA sensor would not cause an MCAS-created safety of flight problem; this decision permitted the certification of a design that has caused two aviation disasters based on a single point of failure.

189. By misusing its ODA, BOEING was able to quickly achieve a mass production level of the BOEING 737 MAX 8 and other MAX variants.

190. BOEING continued to misrepresent to the FAA that the BOEING 737 MAX 8 was safe, even after the crash of Lion Air, because BOEING would suffer significant financial losses if the FAA grounded the airplane. In doing so, BOEING chose to prioritize its profits ahead of the safety of crew members and passengers.

191. BOEING continued to misrepresent to the FAA that the BOEING 737 MAX 8 was safe, even after the crash of Lion Air, even though BOEING knew that MCAS had caused the crash.

192. The FAA relied on BOEING's assurances regarding the safety of the BOEING 737 MAX 8 in not grounding the airplane after the Lion Air disaster.

193. BOEING perceived that its financial interests would be best served by quickly manufacturing as many BOEING 737 MAX 8 airplanes as possible in order to better compete with the Airbus A320neo.

194. BOEING drove its employees to unsafe work production levels and ignored complaints that its production schedule was unsafe, and continued to increase production levels.

195. BOEING ignored its employees' complaints that its work production expectations and continually increasing production schedule were causing manufacturing mistakes, including dangerous mistakes concerning the airplane's wiring.

196. BOEING ignored its employees' complaints that its work production expectations and production schedule had caused foreign object debris (FOD) to be left in BOEING 737 MAX 8 airplanes, and other BOEING production aircraft both in its South Carolina and Washington facilities, which could pose dangers to the aircraft wiring, including wiring associated with the airplane's AOA sensors and Flight Control Computer.

BOEING'S "FIX" AFTER THE LION AIR CRASH DID NOT WORK

197. On November 7, 2018, BOEING published an update to its operators' airplane flight manuals (AFMs) intended to provide flight crews with information on the MCAS and the procedures needed to address a runaway stabilizer on the 737 MAX aircraft.

198. The same day, November 7, 2008, the FAA issued an Emergency Airworthiness Directive (AD 2018-23-51) requiring the operators of Boeing's 737-8 and 737-9 MAX aircraft to incorporate Boeing's update into their respective AFMs within 30 days.

199. In its emergency directive, the FAA described an "urgent safety of flight situation" caused by an "unsafe condition" in the MAX: "if an erroneously high single angle of attack (AOA) sensor input is received by the flight control system, there is a potential for repeated nose-down trim commands of the horizontal stabilizer. This condition, if not addressed, could cause the flight crew to have difficulty controlling the airplane and lead to excessive nose-down attitude, significant altitude loss, and possible impact with terrain."

200. Therefore, prior to March 10, 2019, the date of the subject flight, BOEING knew and accepted that MCAS was defective and was working on a software fix to address its defects, while at

the same time misrepresenting to the public, the FAA and its customers that the BOEING 737 MAX 8 was safe to fly. Such knowledge and inaction demonstrated reckless indifference and conscious disregard for the flying public and the Decedent.

BOEING CONSIDERED CRITICAL UPDATES TO THE 737 MAX 8'S AUTOMATED FLIGHT CONTROL SYSTEM AFTER LION AIR BUT DELAYED ACTING UNTIL AFTER THE SUBJECT CRASH

201. After the crash of Lion Air, BOEING quietly began to make design changes to the 737 MAX 8's automated flight control system, which it planned to implement by way of an MCAS "software update."

202. Following the crash of Flight 302, BOEING confirmed that it had for several months, in BOEING words, "been developing a flight control software enhancement for the 737 MAX, designed to make an already safe aircraft even safer."

203. BOEING continued to describe to operators, to the FAA, to the pilots and to the public, its 737 MAX 8 airplane as a "safe aircraft" despite the fact that two Boeing 737 MAX 8 airplanes had crashed in the prior 5 months with a total of 346 lives lost—the second-highest fatal accident rate for a commercial aircraft model in the modern era, and the highest in this century (excluding terrorism).

204. According to BOEING, the MCAS software update was developed "to provide additional layers of protection if the AOA sensors provide erroneous data."

205. BOEING failed to acknowledge that the initial version of the MCAS, installed in both the Lion Air and Ethiopian Airlines crashed planes did not provide 737 MAX 8 pilots with even a single layer of protection from erroneous data provided by a defective AOA sensor.

206. The MCAS software update that BOEING was working on, even as BOEING maintained that the BOEING 737 MAX 8 was completely safe, is advertised to include, among others:

a. MCAS AOA Sensor Enhancements – The flight control system will now compare inputs from both AOA sensors. If the sensors disagree by 5.5 degrees or more with the flaps up, MCAS will not activate and an indicator on the flight deck display (the "disagree alert") will alert the pilots to the discrepancy;

b. MCAS Activation Enhancements – If MCAS is activated in abnormal conditions it will only provide one input for each elevated AOA event; and

c. MCAS Command Limit – MCAS can never command more stabilizer input than can be counteracted by the flight crew pulling back on the column. The pilots will always have the ability to override MCAS and manually control the airplane.

207. In addition to the MCAS software update, BOEING decided that pilots already rated to fly prior Boeing 737 models should be required to undergo additional computer-based training and manual review before being allowed to fly the 737 MAX 8.

208 The additional requirements allegedly were designed to provide pilots with an "enhanced" understanding of the 737 MAX 8 Speed Trim System, including the MCAS function, associated existing crew procedures, and related software changes.

209. BOEING describes the new training and review program as "enhanced," but fails to acknowledge that the previous self-guided computer training program given to the pilots of 737 MAX 8's did not include sufficient or effective information and training on the MCAS.

210. Rather than grounding the Boeing 737 MAX 8 until it was fixed and made safe, BOEING chose to prioritize profits over passenger safety, keeping its Boeing 737 MAX 8 airplane in service first after Lion Air and again after the subject crash, intentionally misleading its customers, the FAA, passengers and the public that the airplane was safe to fly. Such acts and

omissions demonstrate intentional reckless indifference and conscious disregard for the safety of the flying public and the Decedent.

DEFECTS IN THE BOEING 737 MAX 8 AIRPLANE CAUSED THE CRASH OF ETHIOPIAN AIRLINES FLIGHT 302 AND THE LOSS OF PLAINTIFFS' DECEDENT

211. On March 10, 2019, Decedent George K. Thugge, was a fare-paying passenger on board Flight 302.

212. Flight 302, a regularly-scheduled commercial flight, departed Addis Ababa Bole International Airport at 8:38 AM local time (5:38 A.M UTC) bound for Jomo Kenyatta International Airport in Nairobi, Kenya.

213. Within a minute after takeoff, Flight 302's left AOA sensor recorded erroneous values and its left stall warning system (stick shaker) activated and remained active until near the end of the flight.

214. Flight 302's flight data recorder later revealed that shortly after take-off, the airplane's left AOA sensor data suddenly deviated significantly from the right AOA sensor data; the left AOA sensor data reached a maximum value of 74.5 degrees nose up, an erroneous and implausible nose high AOA, while the right AOA sensor data reached a maximum value of 15.3 degrees.

215. Flight 302 also experienced airspeed, altitude and flight director pitch bar values on its left side that deviated from the airplane's right-side values, with the left side values measuring notably lower than the right-side values.

216. The erroneous and implausible data transmitted by Flight 302's left AOA sensor indicated to the airplane that it was at an extreme nose high attitude and at risk of stalling, triggering the airplane's left stall warning system (stick shaker) to activate.

217. The erroneous data from Flight 302's left AOA sensor also caused the airplane's MCAS to activate and command automatic nose down trim inputs.

218. Flight 302's flight crew followed BOEING' s recommended procedures: the airplane's cockpit voice recorder the First Officer calls out "stab trim cut-out" twice after the MCAS dove the airplane down toward the ground, followed by the captain's concurrence, indicating that the pilots shut off the electric trim.

219. Flight 302's flight crew, however, found it impossible to manually control the forces on the airplane with the yoke.

220. Despite both pilots desperately pulling back on the yoke and attempting to manually trim the airplane's nose together, they could not pull the airplane out of the MCAS-commanded dive.

221. Shortly before the crash, Flight 302's desperate pilots reengaged the electric trim and began trimming the airplane's nose back up, but MCAS again activated and pushed the nose down.

222. At 8:44 AM local time (5:44 AM UTC), Flight 302 disappeared from radar and impacted terrain approximately 28 miles southeast of the airport, destroying the airplane and killing all 157 people on board, including Mr. Thugge.

223. Flight 302 hit the ground with a nose-down dive angle of 40 degrees.

224. Decedent George K. Thugge suffered extreme fear, pain and injuries before death, and multiple repeated painful and terrifying impacts prior to the final impact and death after Flight 302 crashed.

225. The Flight 302 disaster demonstrated that BOEING did not properly, honestly, legally or adequately respond to the Lion Air disaster, in particular that the BOEING 737 MAX 8 airplane should have been grounded after the Lion Air crash and that BOEING should have taken all means to warn operators, pilots, passengers, the public, the FAA and other safety regulators around the world.

226. The Flight 302 crash demonstrated that the information provided by BOEING to 737 MAX 8 pilots, including the recommended emergency procedure, was insufficient to address the airplane's MCAS defect.

227. The Flight 302 crash demonstrated, just as had the Lion Air crash, that BOEING's 737 MAX 8 violated the FAA Airworthiness Standards for Commercial Aircraft, which require that airplanes must be safely controllable and maneuverable during all phases of flight and that it must be possible to make safe and smooth transitions from one flight condition to another without exceptional piloting skill, alertness, or strength.

228. Even after the crash of Flight 302, BOEING continued to insist that the 737 MAX 8 airplane was safe, misleading the FAA, operators, pilots, passengers, the public, and other nations aviation regulators.

229. In the wake of the Flight 302 disaster, Boeing's CEO, Dennis Muilenburg, spoke twice with President Donald J. Trump to assure him that the Boeing 737 MAX 8 was safe and should not be grounded.

230. The FAA continued to side with BOEING over safety and the U.S. delayed the grounding of the airplane while Secretary of Transportation Elaine Chao, who oversees the FAA, flew from Austin, Texas to Washington, D.C. in a Boeing 737 MAX 8 to demonstrate her confidence in the airplane's safety.

231. Of course by the time Secretary Chao took her 737 MAX 8 flight to pander to the media, the U.S. airlines operating the 737 MAX 8 had meetings with BOEING, received additional briefings and instructions and had been assured that U.S. operators of the 737 MAX 8 aircraft had the 737 MAX 8 safety features that other and foreign operators did not.

232. The President of the United States took the unprecedented step of ordering the FAA to ground the aircraft, when his own FAA, FAA Administrator and DOT Secretary did not.

233. The President took this action after airlines and countries around the world grounded the Boeing 737 MAX 8 because of safety concerns, two deadly crashes and many U.S.A. passengers refusing to board Boeing 737 MAX 8 airplanes.

234. Finally on March 13, 2019, the FAA grounded the Boeing 737 MAX 8 and 737 MAX 9 airplanes, after the rest of the world had already taken such action. Only the skies of the U.S.A. and U.S.A. citizens had been left exposed to grave danger by their own U.S.A. aviation safety regulators.

235. On April 5, 2019, BOEING's CEO issued a statement acknowledging that the crashes of Lion Air and Flight 302 were caused by MCAS and admitted that "[w]e have the responsibility to eliminate this risk, and we know how to do it." He continues, however, to deny that the airplane was unsafe BOEING's acts and omissions demonstrated reckless indifference and conscious disregard for the safety of the flying public.

236. BOEING has many safety issues with the 737 MAX 8 in addition to those discussed above because the BOEING 737 MAX 8 differs from previous aircraft models other than more powerful engines to compete in the market with the European Airbus commercial aircraft, and modifications to its tail assembly and landing gear, which caused changes to the airflow over the wings and tail, changes to weight and balance, changes to center of gravity, changes to flight characteristics and changes in piloting and handling, among others, not approved by prior type production approvals and amendments.

237. Additional differences on the 737 MAX 8 included, but were not limited to:

1. Abnormal nose-up pitching which is not allowed under 14 CFR § 25.203(a) "Stall Characteristics

2. Maneuvering Characteristic Augmentation System (MCAS)

3. Angle of Attack Disagree Alert admitted by BOEING to have been mistakenly enabled only on some aircraft (an error discovered in 2017 and shared with the FAA but not corrected)

4. Altered labeling and purposes of the toggle switches to shut off power to the horizontal stabilizer making it so there was no way for the pilots to turn off aircraft functions including MCAS without turning off the thumb buttons on the pilots' yoke ("steering wheel") that the pilots use to control the horizontal stabilizer.

5. Changes to manuals, training, simulator modules and other information and instruction products.

6. New engines, CFM LEAP-1B flow with a 69.4 inch diameter as opposes to the prior 61 inch, producing different thrust;

7. New engine nacelles and pylons causing the engines to project further forward;

8. New software;

9. New fuel systems;

10. New pneumatic systems;

11. New nose gear extension to give the bigger engines more ground clearance, amounting to an 8 inch lift;

12. Changes to nose wheel to accommodate a larger nose gear strut;

13. New fly-by-wire spoiler system;

14. Reshaped tailcone;

15. New winglets with upward and downward airfoils;

16. Structural strengthening;

17. Onboard Network System;

18. Four 15.1 inch cockpit display screens;

19. New electronic air system;

20. The number of seats changed;

21. The range changed;

22. The length changed;

23. The wingspan changed;

24. Weight changes;

25. Center of gravity changes; and including but not limited to

26. Flight characteristics changes; among others.

PILOT TRAINING

238. Instead of requiring additional pilot training and making clear changes, updates, verifications and edits to manuals and instructional materials concerning the 737 MAX 8, BOEING sought to address modifications on the 737 MAX 8 by designing and installing the MCAS.

239. The airlines and pilots were not informed or fully informed about MCAS and its dangerous propensities nor were operators and pilots trained to spot and overcome 737 MAX 8 dangers, if that was even possible and the crashes of Lion Air and Flight 302 showed it was not possible.

240. Not only did BOEING knowingly and intentionally failed to provide proper notification to operators and pilots regarding when the MCAS was operating and active on the 737 MAX including the Flight 302 aircraft, it did not warn operators and pilots that in certain circumstances it might cause the airplane to precariously pitch down, or automatically force the airplane into a cycle of recurring and/or powerful dives. In addition, BOEING did not provide pilots with sufficient information about how to immediately and properly respond to an MCAS that is forcing unwarranted and/or repeated dives that can lead to tremendous forces on the flight controls that preclude safe recovery.

241. BOEING designed, produced, marketed and sold the aircraft and pilot and other manuals, instructions and informational materials which did not provide notice and proper guidance on

addressing and/or overcoming the MCAS commands, or of many of the other changes to the 737 MAX 8 model which affected the operation of the plane.

242. At the certification of the 737 MAX 8, the FAA delegated to BOEING substantially all of safety analysis and certification not only of the plane but also the certification of the training, manuals and other such instructions.

243. BOEING was responsible for the analysis, development, writing, updating, testing, verification, production, marketing and sales of its manuals and instructional materials.

244. BOEING in these materials deliberately and falsely led the airline aircraft purchasers into believing that pilots did not need additional flight training on the 737 MAX 8, and that purchasers did not need to be fully informed about the 737 MAX 8. BOEING did this to entice purchase of the 737 MAX 8 by marketing that minimal desktop or no training was necessary in transitioning to the subject aircraft. The manuals, whether printed, electronic software, and other materials including marketing materials, perpetuated BOEING's myths and intentionally concealed the danger, intentionally defrauding operators, pilots, passengers and the public.

245. Due to the intentional misrepresentations and concealment by BOEING, pilots of the 737 MAX 8 lacked proper training and airlines and the public were defrauded, and Decedent lost his life.

246. Thus, after October 29, 2018, when the Lion Air BOEING 737 MAX 8 crashed into the sea shortly after take-off, the FAA issued an Emergency Airworthiness Directive (AD) 2018-23-51 that identified the "unsafe condition…likely to exist or develop" in the subject aircraft, but neither BOEING, nor the FAA, sought to ground the 737 MAX 8 -- not for the defects in the aircraft or for the defects in the manuals, training and other materials.

247. BOEING could have voluntarily grounded the 737 MAX 8 by voluntarily relinquishing or tendering its certification. BOEING did not do so despite having greater knowledge than the FAA or the airlines and pilots of the "unsafe condition…likely to exist or develop."

248. Therefore on the date of the subject crash, the aircraft possessed a certificate of airworthiness which BOEING could have voluntarily revoked and should have long before Flight 302.

THE PILOTS DID NOT CAUSE THE PLANE TO MALFUNCTION

249. The pilots possessed the training, certificates, licenses, and qualifications to conduct the flight and there were no adverse weather conditions affecting the flight.

250. The pilots had completed all the training which BOEING claimed was necessary to operate the aircraft.

251. The pilot(s) on the subject aircraft followed the protocol that had been made known to them as best they could under emergent circumstances, with little altitude and thus little time to troubleshoot and overcome the MCAS system.

252. Despite the flight crew's best efforts, the crew was unable to pull the 737 MAX 8 out of the deadly uncommanded dive.

SUMMARY

253. BOEING recklessly violated a fundamental principle of air safety by designing the flight control system of the subject aircraft with a single-point failure mode that would foreseeably trigger a series of events that would cause a loss of control of the plane and end in a crash. BOEING repeated the reckless actions it took in the 737 program in the early 1990s with a single point failure rudder assembly. Now, as before in the 737 program, this single point failure caused multiple 737s to perform uncommanded nose-dives into the ground and kill hundreds of people.

254. The investigation by the air accident investigators to date has not found other causes that interfered with normal operation or caused this crash.

255. At the time the Flight 302 aircraft left the custody and control of BOEING and entered the market, by and through the actions or omissions of BOEING, the subject BOEING aircraft, and the BOEING aircraft manuals and other instructional materials were defective in design, failed to require safety standards, had inadequate warnings, had inadequate instructions and disclosures, and were unreasonably dangerous including but not limited to the following, among others:

a. the subject aircraft's automated flight control system on the 737 MAX series forced the aircraft to dive, nose down, automatically, toward the ground in situations where such dives are unwarranted, uncommanded, unreasonably dangerous, and erroneous;

b. the subject aircraft's, electrical and computer components, erroneously and automatically, forced the nose of the airplane down, forcing it to dive, even when the aircraft is being flown manually by pilots;

c. the subject aircraft's flight control system incorrectly and automatically operated the aircraft in such a way as to cause repeated excessive nose-down inputs and significant altitude loss which was catastrophic and deadly when it occurred on Flight 302;

d. the subject aircraft's automatic MCAS flight control system dangerously and defectively forced the stabilizer to get very far out of trim causing excessive and uncontrollable forces to occur, which prevented successful manual trimming to allow for safe recovery;

e. the subject aircraft's sensors were defective and generated false readings, including false readings related to the aircraft's AOA—the angle between the wing and the oncoming airflow—which triggered the aircraft's automated flight management and control systems to push the aircraft's nose downward;

f. the subject aircraft lacked standard safety equipment, including a comparative AOA indicator, that would have indicated discrepancies between sensors in a given flight configuration which caused it to be unreasonably dangerous;

g. the subject aircraft's cut-off switches were altered and leaving the pilots unable to correct the subject aircraft's automatic dive in the manner in which they were trained;

h. the subject aircraft's lack of redundancies in its sensors rendered it unreasonably dangerous because inputs forced the aircraft into an uncontrollable nosedive;

i. BOEING's lack of warnings to the airlines, pilots, passengers, regulators and all intended third-party consumers about the defective automation that caused the subject aircraft to dive;

j. BOEING's lack of training to users, including of potential manual overrides to the subject aircraft's defective system and a lack of training in high-speed nose low recovery;

k. BOEING's incorporation of material changes without sufficient testing and data;

l. BOEING's failure to properly and adequately test the subject aircraft, its flight control system, and its sensors; and

m. BOEING's marketing and defective manuals, training, and other information and materials about the 737 MAX 8 were incomplete, misleading, and intentionally concealed dangerous defects.

COUNT I
STRICT PRODUCTS LIABILITY – AIRCRAFT

256. All other paragraphs of this Complaint are incorporated herein by reference.

257. At all relevant times, the subject aircraft was sold and delivered by BOEING without being altered by some other party and without material change in the condition in which it was sold and delivered, and it was being used as intended by, or in a manner that was reasonably foreseeable to, BOEING.

258. The subject aircraft was unreasonably dangerous as designed. At the time of its manufacture, the likelihood that the subject aircraft would cause serious bodily injury or death to passengers aboard the subject aircraft, including Plaintiffs' Decedent, and the magnitude of harm and risk of death and serious bodily injury clearly outweighed the burden and cost on BOEING in designing the subject aircraft in a way that would have prevented the harm, including standard safety equipment, and providing adequate warnings of such defects.

259. BOEING's defects in the design and lack of warnings of the subject aircraft caused the subject crash, which directly, proximately, and foreseeably caused the pre-impact injury, fear of impending and imminent death, conscious suffering, and ultimate death of Plaintiffs' Decedent.

260. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, multiple impacts and injuries, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses, and/or related medical expenses in an amount according to proof at trial.

261. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries, under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss of advice, loss of society, and damages associated with grief, sorrow, and mental suffering, as well as pain and suffering and emotional distress.

262. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious, and/or reckless disregard for the rights and/or safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional damages sufficient to punish BOEING for its outrageous and deplorable conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future.

COUNT II
NEGLIGENCE—PRODUCTS LIBILITY - AIRCRAFT

263. All other paragraphs of this Complaint are incorporated herein by reference.

264. At all relevant times, BOEING owed a duty to use reasonable care, and to exercise the highest degree of care, in planning, designing, certifying, manufacturing,

assembling, installing, overhauling, modifying, repairing, testing, inspecting, marketing, advertising, and distributing its aircraft, including the subject aircraft and its component parts, so as to not cause serious bodily injury to, or the death of, the subject aircraft's passengers, including Plaintiffs' Decedent.

265. BOEING negligently breached the duty of care it owed to the Plaintiffs and the Plaintiffs' Decedent by negligently, carelessly, and recklessly designing the subject aircraft with unreasonably dangerous defects, by designing an unreasonably dangerous product that failed to perform in a manner reasonably to be expected based upon its nature and intended function, and by placing the subject aircraft into the market with unreasonably dangerous design defects.

266. BOEING's defects in the design and lack of warnings of the subject aircraft caused the subject crash, which directly, proximately, and foreseeably caused the pre-impact injury, fear of impending and imminent death, conscious suffering, and ultimate death of Plaintiffs' Decedent.

267. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, multiple impacts and injuries, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses and/or related medical expenses in an amount according to proof at trial.

268. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss of advice, loss of society, and damages associated with grief, sorrow, and mental suffering, as well as pain and suffering and emotional distress.

269. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious, and/or reckless disregard for the rights and/or

safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional damages sufficient to punish BOEING for its outrageous and deplorable conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future.

COUNT III
BREACH OF WARRANTY – AIRCRAFT

270. All other paragraphs of this Complaint are incorporated herein by reference.

271. BOEING was the designer, manufacturer, assembler, producer, distributor, and/or seller of the subject aircraft, and/or its component parts, involved in the subject crash.

272. Prior to the subject crash, BOEING expressly and/or impliedly warranted and represented that the subject aircraft and its component parts was airworthy, of merchantable quality, both fit and safe for the purpose of commercial air travel for which it was designed, intended, and used, and free from all defect. The subject aircraft and its component parts were in substantially similar material condition at delivery to Ethiopian Airlines.

273. Plaintiffs' Decedent, as one of the passengers on the subject aircraft and flight, was an intended third-party consumer of BOEING's warranties that the subject aircraft was airworthy, of merchantable quality, both fit and safe for the purpose of commercial air travel for which it was designed, intended, and used, and free from all defects.

274. Plaintiffs' Decedent reasonably relied upon said warranties of safety to his and his family's detriment, suffering and death.

275. BOEING's breach of express and/or implied warranties of the subject aircraft caused the subject crash, which directly, proximately, and foreseeably caused the pre-impact

injury, fear of impending and imminent death, conscious suffering, and ultimate death of Plaintiffs' Decedent.

276. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, multiple impacts and injuries, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses and/or related medical expenses in an amount according to proof at trial.

277. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss of advice, loss of society, and damages associated with grief, sorrow, and mental suffering, as well as pain and suffering and emotional distress.

278. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious, and/or reckless disregard for the rights and/or safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional damages sufficient to punish BOEING for its outrageous and deplorable conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future.

COUNT IV
FAILURE TO WARN – AIRCRAFT

279. All other paragraphs of this Complaint are incorporated herein by reference.

280. At all relevant times, BOEING negligently failed to warn the public and passengers, the airlines, the pilots, the users, the intended third-party consumers of the 737 MAX 8's unreasonably dangerous and defective design, including that the aircraft would un-commanded and uncontrollably dive because of erroneous sensors,

281. At all relevant times, BOEING had knowledge that the subject aircraft was defective, dangerous, unsafe, and not airworthy and had knowledge of the unreasonably unsafe design of the AOA sensor and automated MCAS, the unstable pitch-up flight characteristic and the many dangerous system design changes to the 737 MAX 8 as well as the magnitude of risk for serious bodily injury and death if those systems were to fail.

282. Ordinary consumers, including pilots, flight attendants, passengers and Decedent, would not have recognized the potential risks presented by the subject aircraft's unreasonably dangerous and defective design.

283. BOEING's defects in the design and lack of warnings of the subject aircraft caused the subject crash, which directly, proximately, and foreseeably caused the pre-impact injury, fear of impending and imminent death, conscious suffering, and ultimate death of Plaintiffs' Decedent.

284. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, multiple impacts and injuries, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses, and/or related medical expenses in an amount according to proof at trial.

285. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss of advice, loss of society, and damages associated with grief; sorrow, and mental suffering, as well as pain and suffering and emotional distress.

286. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious and/or reckless disregard for the rights and/or safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional

damages sufficient to punish BOEING for its outrageous and deplorable conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future. BOEING intentionally concealed the inherent dangers of the subject aircraft and purposely choose not to warn domestic and international airlines, pilots, passengers, the Decedent and the world wide community at large, of the plane's concealed defects.

MANUALS, TRAINING, SIMULATORS AND OTHER DOCUMENT PUBLICATIONS, MATERIALS AND REPRESENTATIONS

287. When BOEING produces, markets and sells an aircraft, BOEING also produces, markets and sells flight, maintenance, training and other manuals and documents, as well as software, subscriptions and simulators and/or simulator modules and software, which BOEING also promoted as being approved, safe, appropriate and adequate for the safe and airworthy operation of BOEING aircraft.

288. Those manuals, documents and other materials (generally referred to herein as manuals) may include but are not limited to:

Weight and Balance Manuals
Maintenance Planning Data Document (MPD)
Master Minimum Equipment Lists
Maintenance Manuals
Software Manuals
Interactive Fault Isolation Manuals (IFIM)
Maintenance Review Board Documents (MRB)
Flight Crew Data
Cabin Crew Data
Training Requirements
Flight Crew Training Manuals (FCTM)
Flight Crew Operations Manuals (FCOM)
Airplane Flight Manuals (AFM)
Aircraft Operating Manuals (AOM)
Aircraft Maintenance Manuals (AMM)
Quick Reference Handbooks (QRH)
Simulator Management & Support Manuals

Flight Operations Manuals (FOM)
Avionics Maintenance & Training Manuals
Technical Training Manuals (TTM)
Mandatory Maintenance Instructions
Boeing Technical Content Management, Technical Documentation, Technical Publications, and Training Materials
Boeing Flight Training, Pilot Services, and Pilot Development
Boeing Operational and Training Notes
Boeing Checklists
Instructions for Continued Airworthiness
Simulator Software and Modules
And others.

289. These manuals and other items listed above, among others, are a separate BOEING product, separate and different from the aircraft, including but not limited to situations where:

a. Defects exist in the manual that do not exist in the plane;

b. Defects or other problems exist in the plane but are not, or not adequately addressed in the manual;

c. The manuals or other items were obtained in separate transactions from the sale or lease of the plane;

d. The items are continuing subscriptions or services; and

e. BOEING produced, provided, written, developed and marketed updates, edits, corrections, additions, amendments, or any other subsequent materials and they are erroneous, defective, inadequate, dangerous or misleading.

290. The relevant products liability law recognizes separate and distinct claims for defective separate products.

291. Most of the manuals and items are not or not required to be carried on the plane and thus they are not part of the aircraft, but a separate product.

292. Express warranties as defined by South Carolina law include not only affectations of facts or promises made by sellers relating to their good but also to descriptions of goods and statements proving that the product performs in a certain manner.

293. BOEING manuals and other such items promise and warrant safe operation if the user follows the instructions contained therein, and this constitutes an express warranty.

294. Using these products as directed, the manuals and other such materials failed to perform as warranted thereby causing or contributing to the crash of Flight 302 and the death of Decedent.

295. Errors in BOEING manuals and other materials were introduced both before and after the Lion Air crash, but all times relevant herein before the Ethiopian Airline crash.

COUNT V
STRICT PRODUCTS LIABILITY – MANUALS

296. All other paragraphs of this Complaint are incorporated herein by reference.

297. At all relevant times, the subject manuals training and other such materials were sold and delivered by BOEING without being altered by some other party and without material change in the condition in which they were sold and delivered, and they were being used as intended by, or in a manner that was reasonably foreseeable to, BOEING.

298. The subject manuals and other materials were unreasonably dangerous as designed. At the time of its manufacture, the likelihood that the subject manuals and materials would cause serious bodily injury or death to passengers aboard the subject aircraft, including Plaintiffs' Decedent, and the magnitude of harm and risk of death and serious bodily injury clearly outweighed the burden and cost on BOEING in developing, writing and producing the subject manuals and materials in a way that would have prevented the harm, including increased training and providing adequate warnings of such defects.

299. BOEING's defects in the design and lack of warnings of the subject manuals and materials caused the subject crash, which directly, proximately, and foreseeably caused the pre-impact injury, fear of impending and imminent death, conscious suffering, and ultimate death of Plaintiffs' Decedent.

300. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, multiple impacts and injuries, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses, and/or related medical expenses in an amount according to proof at trial.

301. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss or advice, loss of society, and damages associated with grief, sorrow, and mental suffering, as well as pain and suffering and emotional distress.

302. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious, and/or reckless disregard for the rights and/or safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional damages sufficient to punish BOEING for its outrageous and deplorable conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future.

COUNT VI
NEGLIGENCE—PRODUCTS LIABILITY – MANUALS

303. All other paragraphs of this Complaint are incorporated herein by reference.

304. At all relevant times, BOEING owed a duty to use reasonable care, and to exercise the highest degree of care, in planning, designing, certifying, writing, producing,

modifying, repairing, testing, inspecting, marketing, advertising, and distributing its manuals, training and other materials so as to not cause serious bodily injury to, or the death of, the subject aircraft's passengers, including Plaintiffs' Decedent.

305. BOEING negligently breached the duty of care it owed to the Plaintiffs and the Plaintiffs' Decedent by negligently, carelessly, and recklessly designing, writing, editing, producing and distributing the subject manuals, training and materials with unreasonably dangerous defects, by designing an unreasonably dangerous product that failed to perform in a manner reasonably to be expected based upon its nature and intended function, and by placing the subject manuals into the market with unreasonably dangerous design defects.

306. BOEING's defects and lack of warnings in the subject manuals, training and materials caused the subject crash, which directly, proximately, and foreseeably caused the pre-impact injury, fear of impending and imminent death, conscious suffering, and ultimate death of Plaintiffs' Decedent.

307. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, multiple impacts and injuries, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses and/or related medical expenses in an amount according to proof at trial.

308. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss of advice, loss of society, and damages associated with grief, sorrow, and mental suffering, as well as pain and suffering and emotional distress.

309. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious, and/or reckless disregard for the rights and/or

safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional damages sufficient to punish BOEING for its outrageous and deplorable conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future.

COUNT VII
BREACH OF WARRANTY – MANUALS

310. All other paragraphs of this Complaint are incorporated herein by reference.

311. BOEING was the designer, writer, editor, producer, distributor, and/or seller of the subject manuals, training and other materials involved in the subject crash.

312. Prior to the subject crash, BOEING expressly and/or impliedly warranted and represented that the subject manuals, training and other materials were airworthy of merchantable quality, both fit and safe for the purpose of commercial air travel for which they were designed, written, published, edited, intended, and used, and free from all defect. The subject manuals, training and other materials were in substantially similar material condition at delivery to Ethiopian Airlines.

313. Plaintiffs' Decedent, as one of the passengers on the subject aircraft and flight, was an intended third-party consumer of BOEING's warranties that the subject manuals were airworthy, of merchantable quality, both fit and safe for the purpose of conducting commercial air travel operators for which it was designed, intended, and used, and free from all defects.

314. Plaintiffs' Decedent reasonably relied upon said warranties of safety to his detriment, suffering and death.

315. BOEING's breach of express and/or implied warranties of the subject manuals caused the subject crash, which directly, proximately, and foreseeably caused the pre-impact

injury, fear of impending and imminent death, conscious suffering, and ultimate death of Plaintiffs' Decedent.

316. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, multiple impacts and injuries, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses and/or related medical expenses in an amount according to proof at trial.

317. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss of advice, loss of society, and damages associated with grief, sorrow, and mental suffering, as well as pain and suffering and emotional distress.

318. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious, and/or reckless disregard for the rights and/or safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional damages sufficient to punish BOEING for its outrageous and deplorable conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future.

COUNT VIII
FAILURE TO WARN – MANUALS

319. All other paragraphs of this Complaint are incorporated herein by reference.

320. At all relevant times, BOEING negligently failed to warn the public and passengers, the airlines, the pilots, the users, Decedent, other intended third-party consumers and other nations safety regulators of the 737 MAX 8's unreasonably dangerous and defective manuals, training and other materials including that the manuals did not reveal the existence of

a system which could cause uncommanded and uncontrollable dive that it could be impossible for the pilots to save this plane, and other dangerous and deadly conditions.

321. At all relevant times, BOEING had knowledge that the manuals, training and other materials were defective, dangerous, unsafe, and not airworthy and had knowledge of the unreasonably safe design of the AOA sensor, automated MCAS changes to the cut-off switches, and others which were not revealed in the manuals, as well as the magnitude of risk for serious bodily injury and death because the manuals did not disclose, train and warn about those systems.

322. Ordinary consumers, including pilots and passengers, would not have recognized the potential risks presented by the subject manuals, training and other materials unreasonably dangerous and defective design and dangerous condition.

323. BOEING's defects in the design and lack of warnings of the subject manuals and materials caused the subject crash, which directly, proximately, and foreseeably caused the pre-impact injury, fear of impending and imminent death, conscious suffering, and ultimate death of Plaintiffs' Decedent.

324. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, multiple impacts and injuries, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses and/or related medical expenses in an amount according to proof at trial.

325. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss of advice, loss of society, and damages associated with grief, sorrow, and mental suffering, as well as pain and suffering and emotional distress.

326. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious, and/or reckless disregard for the rights and/or safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional damages sufficient to punish BOEING for its outrageous and wanton conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future. BOEING intentionally concealed the inherent dangers of the subject manuals and purposely choose not to warn domestic and international airlines, pilots, passengers and the world wide community at large of the dangerous defects associated with these manuals and materials.

COUNT IX
PUNITIVE DAMAGES UNDER THE NONECONOMIC DAMAGES AWARD ACT OF 2005

327. All other paragraphs of this Complaint are incorporated herein by reference.

328. Pursuant to the South Carolina Code of Laws Section 15-32-200 et seq., Plaintiff is entitled to claim punitive damages.

329. BOEING's behavior as set forth herein and as discovery in this litigation and other federal criminal and civil investigations will further prove, amounts to willful, wanton, egregious, outrageous and actionable behavior, which was knowingly and intentionally undertaken and is dangerous and deadly.

330. Pursuant to the statute Plaintiffs may not request an amount, and therefore only respectfully request all punitive amounts allowed by law.

331. However, in the event the jury shall return a punitive damages verdict in excess of the greater of three times the amount of compensatory damages to each claimant entitled thereto or the sum of five hundred thousand dollars, the Plaintiffs request the court consider, as

expressly allowed by statute, whether BOEING's conduct together with the high likelihood of injury resulting from the conduct, was known or approved by BOEING's managing agent director, officer or the person making policy decisions on behalf of BOEING or whether BOEING's actions could subject BOEING to conviction of a felony and those actions and course of conduct of BOEING are proximate causes of Plaintiffs' damages, and in such case the punitive damages may not exceed the greater of four times the amount of compensatory damages to each claimant or two million dollars per claimant.

332. As the President, Chairman and CEO of BOEING, Dennis Muilenburg, has already stated he approved and condoned BOEING's behaviors and BOEING is already under federal criminal investigation, Plaintiff requests the application of all such punitive provisions. Should BOEING be convicted of or plead guilty to a felony arising out of the same acts or course of conduct complained of herein and that act or course of conduct is the proximate cause of Plaintiffs' damages, pursuant to Section 15-32-530(c)(2) there shall be no cap on punitive damages and Plaintiffs request to amend and supplement this Complaint and these claims should BOEING so plead or be convicted so as to recover unlimited punitive damages.

333. This request is consistent with and in furtherance of the FAA statement and the stated intention of the FAA that the FAA believes subjecting BOEING to private liability is the most effective, forceful and convincing way to cause BOEING to meet (and hopefully exceed) its obligations under Federal Aviation Regulations, as set forth and quoted above on page 11 and specifically set forth in paragraph 58.

COUNT X

VIOLATION OF SOUTH CAROLINA UNFAIR TRADE PRACTICES ACT

334. All other paragraphs of this Complaint are incorporated herein by reference.

335. Defendant BOEING and its employees, contractors, agents and assigns, and each of them, individually and collectively committed unfair methods of competition and unfair conduct in their pursuit of trade or commerce which is offensive to public policy and/or immoral, unethical or oppressive, in deceptive acts and practices, all in violation of the South Carolina Unfair Trade Practices Act, Section 39-5, et seq., and particularly, but without limitation:

a. Unfairly and deceptively making statements about the 737 MAX 8, and concealing dangerous defects, and marketing, advertising, drafting, editing, publishing, and selling the aircraft and flight maintenance, training, software, simulator, technical content and other guidance related to the 737 MAX 8 and other, edits, bulletins and directives, which together with changes revisions were also defective, which were used in and distributed to operators of the BOEING aircraft, operators, pilots, passengers, regulators, and the public, and harming Decedent and these Plaintiffs;

b. BOEING knew or should have known that its representatives, advertising, claims, manuals and other publications, (as well as its 737 MAX 8 aircraft) were defective, erroneous and misleading in that they contained many errors and dangerous omissions;

c. BOEING clearly knew that its marketing, advertising, its representations, claims and statements after the crash of Lion Air, and its publications, representations, statements, the revisions to the erroneous manuals and other information were themselves erroneous, defective, misleading, dangerous and insufficient;

d. BOEING knew its marketing was deceptive erroneous, and misleading, and it made statements, representations, and manuals and/or erroneous revisions and other materials that were deceptive and unfair in that they concealed information that could lead to aviation accidents, injuries and death, and in fact did lead to the crash of Lion Air before the crash of Ethiopian Airlines Flight 302, and the crash of the subject flight;

e. BOEING unfairly and deceptively advertised to Ethiopian Airlines and other 737 MAX 8 operators that the aircraft and its training and manuals and revisions were adequate when they were not;

f. BOEING unfairly and deceptively failed to advise Ethiopian Airlines and other operators and the public in BOEING marketing and communications

> that there was a defect with the aircraft its manuals, its representations, flight characteristics and all other defects and violations set forth herein and as will be further revealed in federal investigations and discovery in this litigation.

336. Defendant BOEING's false, misleading and deceptive marketing and other representations about its aircraft and manuals, and BOEING's advertising, marketing, drafting, editing, publishing, selling, placing into streams of commerce, encouraging and/or requiring reliance on these other and BOEING's representations demonstrates BOEING's capacity to deceive. BOEING's deceptive practices had an impact on the public interest, harming and damaging the public interest. BOEING has a potential to repeat its harmful, deceitful, dangerous and deadly practices, as demonstrated that BOEING has already repeated such practices in the 737 program in the 1990s and now in the provision of BOEING goods and services related to the 737 MAX 8.

337. BOEING's practices constituted unfair and deceptive acts which caused injury and death, and which were willful and knowing violations of § 39-5 et. seq.

338. BOEING had actual knowledge its practices, statements, representations, marketing, manuals and/or revisions, as well as its aircraft and other goods and services, were defective, false, misleading, incomplete, dangerous and deadly, but BOEING attempted to and did conceal.

339. Defendant BOEING knew or should have known these practices were in violation of Sections 39-5-20 et seq. of the South Carolina Unfair Trade Practices Act.

340. Defendant used and employed these acts or practices in willful, knowing, intentional, outrageous, egregious and possible criminal violations of the law.

341. As a result of the unfair and deceptive conduct of Defendant BOEING, and its agents individually and collectively, consumers were harmed, including Mr. Thugge who was a

person injured, and killed, by BOEING's use of the above described deceptive representations, which are methods, acts and/or practices unlawful under South Carolina law. Therefore, Mr. Thugge, his children, his mother and his other next of kin were all consumers harmed by BOEING's practices and they are entitled to bring this action under South Carolina law.

342. Pursuant to Section 39-5-140, Plaintiffs are entitled to bring this action for any ascertainable loss, and request damages equivalent to all ascertainable losses according to proof at trial, and in addition three times the actual damages, and in addition attorney's fees and costs.

COUNT XI
CIVIL CONSPIRACY

343. All other paragraphs of this Complaint are incorporated herein by reference.

344. BOEING conspired with and consented to a scheme, device, plan, and agreement with other entities and individuals, including ODA personnel and BOEING suppliers, contractors, subcontractors, agents and assigns, to certify the BOEING 737 MAX series in violation of the laws and regulations of the United States for the purpose of speeding up the approval process of the BOEING 737 MAX series, to give BOEING a financial and competitive advantage in the aviation industry and to help BOEING compete against Airbus.

345. BOEING and these other entities and individuals engaged in concerted actions to deceive, deny, conceal, or otherwise downplay the hazards and safety problems, concerns and defects in the BOEING 737 MAX 8 including its MCAS, heavier and repositioned engines, and unstable aerodynamics, and many other defects all in violation of federal regulations.

346. BOEING committed tortious and/or unlawful actions in furtherance of the conspiracy, including by failing to correctly classify the safety concerns presented by the MCAS; by failing to adhere to industry standards and regulations in designing and testing the 737 MAX; by failing to recuse itself from the certification process when it knew or should have known that

it was acting under extreme financial pressure to certify the 737 MAX as soon as possible; and by applying pressure, whether directly or indirectly, to the BOEING personnel that had been delegated regulatory authority to certify the 737 MAX without appropriate testing and data, and without adequate time to properly and adequately complete the testing.

347. As a direct and proximate result of this conspiracy, Plaintiffs' Decedent has suffered multiple impacts and injuries, fear of impending and imminent death, conscious suffering, the impact upon the crash and thereafter the ultimate death of Plaintiffs' Decedent.

348. The Plaintiffs claim all damages available under all applicable law, including pre-impact conscious pain and suffering, fear of impending and imminent death, ultimate death, lost earnings and earning capacity, funeral and/or burial expenses, and/or related medical expenses in an amount according to proof at trial.

349. The Plaintiffs claim all damages available to the Estate, the survivors, and the beneficiaries under all applicable law, including those pecuniary losses, loss of companionship, loss of guidance, loss of consortium, loss of advice, loss of society, and damages associated with grief, sorrow, and mental suffering, as well as pain and suffering and emotional distress.

350. Based on the foregoing, BOEING acted willfully, wantonly, with oppression, fraud, malice, and/or with a knowing, conscious, and/or reckless disregard for the rights and/or safety of others, such that Plaintiffs request that the trier of fact award Plaintiffs additional damages sufficient to punish BOEING for its outrageous and deplorable conduct in an amount reasonably related to Plaintiffs' actual damages and BOEING's financial condition for the purpose of deterring BOEING and others similarly situated from engaging in similar conduct in the future.

351. Strong equitable reasons justify the allowance of punitive damages in this unique catastrophic case that has a direct bearing on safe air travel and public safety at large in the United States and worldwide.

352. The Multi Forum Multi Jurisdiction, Act 28 U.S.C. § 1369 is governed by a choice of law analysis for substantive law on liability and damages and punitive damages are permitted under South Carolina law, a state of Defendant's domicile and a BOEING major manufacturing location, and a BOEING home state as evidenced by hundreds of millions of dollars of tax incentives paid to BOEING to locate to, reside in, be at home in and be domiciled in South Carolina.

353. BOEING had knowledge of the magnitude of risk of serious bodily harm, fear of impending death, and death if there was a design defect and/or a failure to warn about a design defect that could cause the aircraft to automatically dive without pilot input.

354. In designing, manufacturing, assembling and selling the accident aircraft with the defects set forth in all Counts herein and in performing or failing to perform the acts set forth said counts, defendant BOEING acted willfully, wantonly, recklessly, and with an intentional or conscious disregard for the safety of Plaintiffs' Decedent and the other 156 Decedents on the subject aircraft.

355. Specifically, Defendant BOEING had actual knowledge of these perilous defects as summarized in this Complaint, and the alarming and deadly findings of the substantially similar Lion Air Flight 610 crash and subsequent FAA Airworthiness Directive. BOEING admitted publicly it had knowledge at least in 2017 and the evidence addressed herein which shows knowledge before 2017. Nonetheless, BOEING consciously and intentionally concealed facts and denied problems and determined it would not ground the subject aircraft and others like

it and would not promptly correct these deadly defects. Furthermore, BOEING refused to promptly warn the airlines, pilots, passengers, foreign and domestic safety authorities and investigators, the domestic and international public at large, and this Decedent, of the risks and defects associated with the subject aircraft and others like it.

356. Defendant BOEING also had actual and/or constructive knowledge of the fact that the flight crews of the subject flight did not know of or have any realistic means or methods to correct the improperly-commanded downward movement, and how to immediately regain safe control of the subject aircraft due to BOEING's lack of transparency about the aircraft system defects and complete and proper training and instruction.

357. Notwithstanding BOEING's actual notice, at a minimum, BOEING had constructive knowledge that the aircraft design of its MCAS system, training, manuals and other components were inherently flawed and were wantonly, knowingly and unreasonably dangerous, as set forth in allegations summarized in this Complaint. BOEING's awareness of the inherent dangers associated with the aircraft were also fully manifested to BOEING after the Lion Air crash.

358. As the direct and proximate result of one or more of the above-described willful, wanton, reckless, intentional, and/or conscious acts or omissions of defendant BOEING, one or more defects in the aircraft, training, manuals or other components caused the aircraft to crash killing all those onboard, including Plaintiffs' Decedent.

359. As a further direct and proximate result of one or more of the aforesaid willful, wanton, reckless, intentional, or conscious acts and omissions of defendant BOEING which resulted in the crash of the accident aircraft, Plaintiffs' Decedent was caused to suffer a multitude

of injuries both a personal and pecuniary in nature, including conscious pain and suffering, and severe terror and fear of impeding death prior to impact and prior to his death.

360. The aforesaid willful, wanton, reckless, intentional, or conscious acts and omissions of defendant BOEING which resulted in the crash of the accident aircraft warrant and justify an award of punitive damages in an amount to punish defendant BOEING for its conduct and to deter future such conduct from BOEING and others.

DAMAGES CAUSED BY BOEING
DEMAND FOR RELIEF AND JURY TRIAL

361. All other counts and paragraphs of this Complaint are incorporated herein by reference and at all times relevant herein BOEING owed a duty to Plaintiffs to exercise not only due care, but the highest standards and duties of care to Plaintiffs' Decedent who was an airline passenger in scheduled commercial service. BOEING breached its duty to Plaintiffs by reason of all the wrongful acts alleged in all counts herein, and Plaintiffs and Plaintiffs' Decedent have sustained as a direct and proximate result of BOEING's breaches, underline losses for which they are entitled to recover under all the above counts and under all applicable wrongful death and survival law and statutes.

WHEREFORE, Plaintiffs request judgment against BOEING as follows:

a. All economic and non-economic damages allowed by law;

b. For a measurable and significant period before, during and after the first and subsequent physical injuries and impacts, as well as before Plaintiffs' Decedent's death, the passengers and Plaintiffs' Decedent sustained significant personal physical injuries, including conscious and physical pain and suffering, pre and post multiple impacts, fright and terror, fear of impending death, mental anguish, emotional distress, and other severe injuries, suffering, distress and harm for a measurable period of time prior to ultimate death;

c. Loss of being able to live life to a natural life expectancy and natural death;

d. Loss of earnings;

e. Loss of gross earning power and earning capacity;

f. Loss of net accumulations;

g. Loss of past earnings;

h. Loss of future and prospective earnings;

i. Loss of inheritance;

j. Other pecuniary losses for the losses;

k. Loss of prospective estate accumulations;

l. Funerals, services, shrines, bereavement, and other expenses been incurred or that have become a charge against the estate or were paid by or on behalf of the Plaintiffs, the estate or family members;

m. Loss of support and services in money or in kind from the date of the crash of, Flight 302 to the extent of the Plaintiffs' Decedent's and Plaintiffs' normal life expectancies;

n. Loss of care, comfort, society, protection, companionship, instruction, guidance, tutelage, counsel, moral support and advice;

o. Physical and mental pain and suffering;

p. Grief, emotional distress, and sorrow;

q. Loss of enjoyment of life;

r. Loss of the value of not having to live one's life alone;

s. Loss of the pleasures of living;

t. Loss of love;

u. Loss of solace;

v. Loss of typical family experiences now supplanted by forever being an air crash family;

w. Loss of consortium;

x. Property loss and damage;

y. Business loss and damage;

z. Pre-judgment interest;

aa. Post-judgment interest;

bb. Any other interest allowed by law;

cc. Costs, expenses, and attorneys' fees;

dd. Punitive and/or exemplary damages as allowed by law;

ee. Any and all other damages to which Plaintiffs', Plaintiffs' Decedent, family members, representatives, estates, survivors and beneficiaries are lawfully entitled under applicable law including under conflicts and choice of law principles;

Respectfully submitted,

By: /s/ Mary Schiavo
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ATTORNEYS FOR PLAINTIFFS

APPENDIX I

Do not copy or disclose except under terms of Protective Order

6M-HA
September 30, 1992

MEETING NOTICE

DATE: October 8, 1992

TIME: 8:00 —— 9:00

LOCATION: 7-206 Building
61B2 6th floor West

SUBJECT/PURPOSE: Develop 737 Rudder PCU Retrofit Strategy

REQUESTED BY:	Jim Hutton	74-02	965-0982
COORDINATED BY:	Bob Gertmla	6M-HA	234-55752

ATTENDEES:

✓ Bernie Turner	6M-HA	Flight Controls
~~Jim Hutton~~	~~74-02~~	~~Rtn. Technology~~
✓ FRANK TSAO Dave Doring	6M-KJ	Reliability
✓ George Dial	6M-WL	Product Safety
✓ Kryn DeJonge	2H-80	Service Engr.
✓ Tom Harrington	6M-HW	Stability & Cont.
✓ Tom Heineman	6M-HA	Flt. Controls DEI
✓ BOB CARLSON Ken Usui	69-10	Airworthiness
✓ MARC CLINE ✓ Rick Krantz	6M-HA	Flight Controls
✓ Mike Hewett	14-HA	Pilot DER
✓ Amy Forner	14-HM	Air Safety Invest
✓ Al Umphenour	2H-30	Post Prod Eng
~~Al John~~	~~76-52~~	~~Logi~~
✓ Mary McCoy	39-HR	Materiel Buyer

cc:

~~Jim Metzer~~	~~6M-KA~~	~~Flight Controls~~
✓ Barry Latter	74-20	Rtn. Engineering
Harry Arnold	74-39	~~Chief Engineer~~

EXHIBIT 119 10-28-91

EXHIBIT

BOD 010550

7L-8-91

737 MAIN RUDDER PCU - DUAL SERVO VALVE RETROFIT
STRATEGY MEETING - OCTOBER 8, 1992

GOALS OF MEETING

- DEVELOP CONSENSUS ON RETROFIT PLAN TO PRESENT TO VP's
- PROVIDE SUPPORTING FACTS & DATA

Jim - This is the pitch I used in the 10-8 mtg. Notes on pages were made during meeting discussion. NO NUMBERS SHOWN HEREON ARE FINAL!

J-EE 10-12

BOD 01051

2:19-cv-01443-DCN Date Filed 05/17/19 Entry Number 1 Page 75 of 84

FACTS AND SUPPORTING DATA

- 3 FUNDAMENTAL FACTS TO GET ACROSS TO VP's
  - WE HAVE A PROBLEM
  - WE DON'T NEED TO GROUND THE FLEET
  - WE DO NEED A RETROFIT PROGRAM TO FIX IT

- SUPPORTING DATA
  - VALVE DOESN'T MEET FAIL-SAFE DESIGN INTENT
    - SINGLE VALVE JAM GIVES POTENTIAL FOR REVERSAL
    - FAILURE ANALYSIS SAYS SINGLE VALVE JAMS ONLY REDUCE MAX RATE
  - HAZARD ASSESSMENT
    - LOSS OF CONTROL JUDGED TO BE ON THE ORDER OF 10^{-8} -> 10^{-10}
    - NO KNOWN REVERSALS IN FLEET HISTORY OF 5×10^{7} HOURS
    - THIS MEANS WE DON'T NEED TO PANIC
    - DOES NOT MEAN WE DON'T NEED TO FIX IT

NEED TO PROVIDE AT LEAST QUALITATIVE INFO ON WHAT EVENTS MAKE THIS UP.

CONFIDENTIAL
Subject to Protective Order in Cases Consolidated Under
MDL Docket No. 1022, In re Air Crash Near Colorado Springs, Colorado on March 3, 1991;
C.A. No. 94-N-9102 (D. Colo.).
Do not copy or disclose, except under terms of Protective Order

CONFIDENTIAL
Subject to Protective Order ... Consolidated Under
MDL Docket No. 1022, In re Air Crash Near Colorado Springs, Colorado on March 3, 1991
C.A. No. 91-N-791 ...
Do not copy or disclose, except ...

RETROFIT OPTIONS

FLEET EXPOSURE ≈ 2500 A/L

OPTION	PROS		CONS
(1) DO NOTHING - REPLACE VALVE ONLY AT CUSTOMER REQUEST	MINIMUM COST	X = 6000/2	HIGH SAFETY CONCERN. CERTIFICATION ISSUE.
(2) RETROFIT @ NEXT PCU ~~OH~~ REMOVAL - LIMIT TO 15k HRS OR 7 YRS, WHICHEVER OCCURS FIRST	REDUCES SAFETY CONCERN NO AOGs MORE EVENLY DISTRIBUTES PCU RETROFIT IN TIME INTERVAL	X = 1500/2	HIGHER COST TO PARKER AND/OR BOEING.
(3) CURRENTLY PROPOSED 4 YR PROGRAM	REDUCES CONCERN FURTHER NO AOGs	X = 1200/2	HIGHER COST TO ALL. HIGH PARKER WORKLOAD
(4) 2-3 YR A.D. PROGRAM	MIN SAFETY CONCERN	X = 600/2	UNDUE CUST. PENALTY. AOGs - LACK OF PARTS. HIGHEST COST TO ALL.

- ADDITIONAL ISSUES FOR DISCUSSION
  - INTERIM AIRPLANE TEST @ "C" CHECK? → Chart on Airplane Test
  - REQUEST ~~A.D. FROM~~ MEETING WITH KEY REGULATORY AGENCIES?

THESE ITEMS AS ACCEPT FOR PREV PAGE

... Removals = 11400 hr 737-100/-200 Chart on 5 in-svc Valve Jams & UAL ... cause.

BOD 010553

APPENDIX II

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: November 10, 1992

In reply refer to: A-92-118 through-121

Honorable Thomas C. Richards
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On July 16, 1992, during a check of the flight controls in a United Airlines (UAL) Boeing 737-300, while taxiing to takeoff from Chicago-O'Hare International Airport, the captain discovered that the airplane's rudder pedal stopped at around 25-percent left pedal travel. The airplane returned to the gate and the main rudder power control unit (PCU) was removed.

The PCU was tested at UAL's maintenance facilities in San Francisco, California, on July 20, 1992. During that testing, the PCU operated in an anomalous manner. Under certain conditions, the actuator piston would move in a direction opposite to the commanded and intended input. However, during other demonstrations, the PCU operated normally.

As a result of the initial observations, the unit was taken to the facilities of Parker Hannifin, the valve manufacturer, at Irvine, California, for further testing by Boeing, Parker Hannifin, and UAL. Test results showed that the dual concentric servo valve installed on the main rudder PCU could, under some circumstances, result in motion opposite to that commanded by the rudder pedals. Boeing and Parker Hannifin then initiated a design review to better understand the nature of the reversal, to develop a design change to preclude the reversal, as well as a plan to implement the design change.

On July 30, 1992, the Safety Board became aware of the taxi incident at Chicago and the subsequent investigation of the PCU. Testing and design change

(5)

5000

efforts are continuing, and Safety Board specialists have participated in these efforts.

During subsequent testing of the rudder PCU, anomalous actions, ranging from sluggish movement of the actuator piston to full reversal in the commanded direction of piston travel, were observed when the input crank was held against the PCU body stops and the yaw damper piston was in the extend position. High internal fluid leakage was also noted. The capability of the PCU to produce force to move the rudder against aerodynamic loads was not measured. The interaction of the yaw damper and the PCU operation as observed is not fully understood. In addition, it is unknown whether the yaw damper was commanding rudder movement at the time that the UAL captain performed the rudder control check. During the tests, it was noted that lower hydraulic operating pressures aided in achieving anomalous actions. Tapping on the dual servo valve body or actuator summing levers prompted the PCU to return to normal operation. Releasing the force on the input crank also returned the PCU to normal operation.

In normal operation, the pilot applies force to the input crank through the rudder pedals. If the pilot releases pressure on the pedal when a direction reversal occurs, the tests show that the PCU should return to normal operation. However, it is highly unlikely that pilots would respond to a rudder reversal by releasing pedal pressure. If, as is far more likely, rudder pressure is held until the rudder has reversed position, the centering unit may supply sufficient force to the input crank to sustain the anomalous condition even though pedal pressure is released.

Analysis by Boeing and Parker Hannifin shows that the potential for rudder reversal could exist in all B-737 main rudder PCUs. The internal stops of the dual concentric servo valve can allow the secondary slide of some valves to overtravel under some conditions. Normally, the primary slide moves about 0.045 inch before the secondary slide moves. If the primary slide is pinned or jammed to the secondary slide, control inputs resulting in the normal movement of the primary slide can lead to the overtravel of the secondary slide. If the overtravel of the secondary slide is sufficient, hydraulic fluid could be routed through a flow passage located outside the normal valve travel range that could result in piston (and rudder) motion in the direction opposite to the input command.

According to Boeing and Parker Hannifin, the effects of an overtravel condition of the secondary slide would not be apparent during approved acceptance tests. Accordingly, one part of the acceptance test was modified to facilitate the

(6)

investigation. During this test, the primary and secondary slides were pinned together to prevent relative motion and were moved through an extended range of motion, as allowed by the internal secondary stops. This range of motion is greater than the normal range of motion of the secondary slide. As the overtravel progressed, the valve porting moved out of normal range, and the pressure and return porting to the respective slides of the actuator piston were interconnected and eventually reversed. The initial effect was excessive internal leakage. Full movement of the slide produced a 3,000 pounds per square inch (psi) reversed pressure drop across the actuator piston with the leakage slowed.

Boeing and UAL have developed a field test procedure to verify the proper operation of the dual servo valve. A total of 212 UAL B-737 airplanes were checked. One main rudder PCU was removed as a result of "hissing" sounds during part of the test. The source of these sounds was attributed to minor leakage in the PCU that was not associated with the dual servo valve. The unit passed acceptance tests and could have been returned to service. There were no other indications of abnormally operating PCUs during the fleet-wide checks. Tests and design analysis indicate that the anomalous operation will occur only when a unique condition prevents independent movement of the primary and secondary slides of the servo valve (a condition that could develop suddenly or occur intermittently). Thus, a one-time check may not ensure that reversal will not occur.

The dual servo valves removed from the B-737s that crashed in Colorado Springs, Colorado, on March 3, 1991, and in the Darien Province of Panama on June 6, 1992, were also tested. The results show that a 50 percent pressure drop could have developed on the Colorado Springs unit if a failure mechanism produced an overtravel of the secondary valve slide. As understood thus far, if such a pressure drop occurred, the main rudder PCU could only develop 50 percent of the rudder hinge moment capability, working in the proper direction. The pressure drop would be similar to losing either A or B redundant hydraulic systems. Moreover, the results show that a complete pressure drop, without reversal, could have developed on the Panama unit only if a failure mechanism produced an overtravel of the secondary slide valve. The unit would lose hinge moment capability, but movement of the rudder in the opposite direction beyond neutral would not occur.

Boeing aerodynamic data for the B-737-200 airplane shows that full rudder deflection (approximately 26 degrees) may be uncontrollable with full control wheel deflection (approximately 107 degrees) under certain conditions. Flap position and

(7)

airspeed are important when determining controllability during full rudder deflection.

Historical maintenance data shows that there have been five other incidents related to the main rudder PCU. It is believed that two of them were detected in flight. On July 24, 1974, the flightcrew of a B-737 reported that the rudder moved "full right" on touchdown. The investigation revealed that the primary and secondary control valves were stuck together by a shot peen ball lodged in the valve.

On October 30, 1975, the flightcrew of a B-737 reported that the rudder pedals moved to the right "half-way" and then jammed. This action was repeated three times and then corrected by cycling the rudder with the standby rudder system. Further examination indicated that the system was contaminated by metal particles.

Another report on October 30, 1975, indicated that during a PCU inspection, a jammed control valve was found. The data associated with this report is insufficient to determine the cause of the PCU removal.

On August 31, 1982, a B-737 reported that the rudder "locked up" on approach and that the flightcrew initiated a go-around and activated the standby rudder system. The landing was uneventful. The examination of the PCU revealed internal contamination and worn seals. It was suspected that high leakage from the worn seals resulted in the PCU having a limited capability to generate enough force to move the rudder.

On November 8, 1990, during an overhaul, a PCU was found to have internal corrosion. The primary slide was stuck at neutral to the secondary as a result of corrosion. There were no reports of malfunction prior to the disassembly.

Boeing and Parker Hannifin are currently developing design changes to the dual servo valve that would limit the travel of the secondary slide to eliminate the potential for pressure and return porting reversal. The Safety Board understands that the rudder PCUs would most likely be returned to Parker Hannifin for modification. Newly defined tolerances would require that parts from the dual servo valve be selectively fit and/or modified to produce acceptable test results. Boeing is planning a retrofit program.

More than 3,000 B-737 main rudder PCUs have been produced. The unit is not a high replacement item that requires large numbers of spares. At this time, only one test fixture is known to exist, and only one facility is prepared to implement the changes. The Safety Board understands that a significant period of time may be required to remove, overhaul, and return to service all rudder PCUs in the B-737 fleet.

The Safety Board recognizes that the B-737-series airplanes have flown about 50 million flight hours, providing safe transportation to the public. Only two confirmed airborne incidents have resulted from rudder operational anomalies, and these did not result in injury to passengers or damage to the airplanes. Nonetheless, the Safety Board believes that rudder malfunctions, as described in this letter, could present significant flight control difficulties under certain circumstances, for example, sudden, large rudder pedal inputs in response to an engine failure during initial climb. Therefore, the Safety Board believes that interim precautionary measures are warranted, pending completion of the long-term PCU overhaul and replacement program.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Require that Boeing develop a repetitive maintenance test procedure to be used by B-737 operators to verify the proper operation of the main rudder power control unit servo valve until a design change is implemented that would preclude the possibility of anomalies attributed to the overtravel of the secondary slide. (Class II, Priority Action) (A-92-118)

Require that Boeing develop an approved preflight check of the rudder system to be used by operators to verify, to the extent possible, the proper operation of the main rudder power control unit servo valve until a design change is implemented that would preclude the possibility of rudder reversals attributed to the overtravel of the secondary slide. (Class II, Priority Action) (A-92-119)

Require operators, by airworthiness directive, to incorporate design changes for the B-737 main rudder power control unit servo valve when these changes are made available by Boeing. These changes should

preclude the possibility of rudder reversals attributed to the overtravel of the secondary slide. (Class II, Priority Action) (A-92-120)

Conduct a design review of servo valves manufactured by Parker Hannifin having a design similar to the B-737 rudder power control unit servo valve that control essential flight control hydraulic power control units on transport-category airplanes certified by the Federal Aviation Administration to determine that the design is not susceptible to inducing flight control malfunctions or reversals due to overtravel of the servo slides. (Class II, Priority Action) (A-92-121)

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in these recommendations.

By: Carl W. Vogt
Chairman

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