

**Testimony of Peg Billson
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**House Transportation and Infrastructure Subcommittee on Aviation
“FAA Aircraft Certification: Alleged Regulatory Lapses
in the Certification and Manufacture of the Eclipse EA-500”
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Chairman Costello and Members of the Subcommittee, thank you for the opportunity to testify today on the certification process of the Eclipse 500 and its unmatched safety record.

I am currently President and General Manager of the Manufacturing Division at Eclipse Aviation Corporation (Eclipse), located in Albuquerque, New Mexico. In this capacity I am responsible for the company’s engineering, supply chain, quality, production and flight operations. From 2005 to until last month I served as Eclipse’s first Chief Operating Officer.

I have bachelor and master degrees in aerospace engineering and have worked in the aerospace industry for more than 25 years. The majority of my experience includes providing leadership for the design, build and in-service support of commercial airliners. I am also an instrument rated pilot with more than 80 flight hours in the Eclipse 500 alone.

Prior to Eclipse, I served at Honeywell International’s Aerospace Division in a variety of positions, including Vice President of Airframe Systems, Vice President of Aircraft Landing Systems and Vice President of Engineering for Engines, Systems and Services. Prior to Honeywell, I spent thirteen years at McDonnell Douglas Corporation, leaving as Vice President of the MD-11, MD-80 and MD-90 Commercial Aircraft programs.

I am very proud to have played a lead role in bringing the Eclipse 500 — the world’s first very light jet — to market. Eclipse is currently the world’s leading VLJ manufacturer and has delivered more than 250 aircraft in 21 months of deliveries.

Eclipse Aviation was founded under the thesis that by providing remarkably lower costs of jet transportation, new markets, new companies and new jobs could be created in American communities that could benefit from point-to-point air transportation. In addition to being the most fuel-efficient and environmentally-friendly jet available, the Eclipse 500 has technology and capabilities normally found in jets costing millions of dollars more, including the latest from Boeing Commercial Airliners. The Eclipse 500 has an acquisition cost dramatically lower than any other jet and empirical data demonstrates that its total operating costs are the lowest of any jet available. This breakthrough has made the benefits of jet transportation available to more people than ever before and inspired an emerging generation of entrepreneurs to create a new form of

air travel — the air taxi. The Eclipse 500 also opened up a new world of convenient air transportation to communities in the United States that are experiencing a decline in commercial service or are simply not served by commercial airlines, thereby enabling economic growth in these areas.

With me today is Eclipse's new CEO, Roel Pieper. Mr. Pieper replaced Vern Raburn, the founder of Eclipse Aviation in July of this year and is providing leadership and experience in taking Eclipse to the next level of growth and operational excellence. Mr. Pieper has extensive executive experience in both the United States and Europe. He is also the Founder and Chairman of the European Technology and Investment Research Center (ETIRC) Aviation, a company which provides European business communities with affordable, on-demand air-taxi jet travel.

We are proud of what Eclipse has accomplished, proud of the safety record the Eclipse 500 has earned to date and proud that we deliver unprecedented performance, reliability, training and service to general aviation. We also are proud that Eclipse employs more than one thousand New Mexicans who manufacture and support the Eclipse 500; plus facilitating thousands of additional jobs at our suppliers throughout the United States.

Designed and Tested with Safety as Top Priority

In more than 32,000 total fleet hours — including more than 5,000 flight test hours — 21 months of customer deliveries and with more than 250 aircraft delivered, no injury or fatality to any Eclipse 500 pilot or passenger has ever occurred. No other aircraft in two decades has entered service with a better safety record.

We believe Eclipse 500's safety record is unprecedented for a new Federal Aviation Regulation Part 23 (General Aviation) aircraft. Our claim that the Eclipse 500 is the most-tested and safest general aviation aircraft can be substantiated by reviewing the following:

- From its suite of advanced avionics, to the structural makeup of the airframe, safety was the overriding tenet of Eclipse's design philosophy for the Eclipse 500.
- To meet the FAA's stringent certification requirements, Eclipse assessed the Eclipse 500's performance and safety across thousands of test points, many in excess of what is required under FAR Part 23.
- The average number of hours accumulated by a test fleet during FAA certification is 1,100 hours. The Eclipse 500 test fleet accumulated more than 5,000 hours prior to FAA type certification.
- The Eclipse 500 state-of-the-art cockpit is designed for safety through the redundancy of vital systems and its ability to reduce a pilot's workload. To ensure availability of critical flight data, the Eclipse 500 is equipped with redundant, high reliability, solid state electronic sensors and displays.
- Eclipse exceeded FAA requirements during static testing of the Eclipse 500 airframe. During these tests, limit loads — as well as ultimate loads — were placed on the airframe. The airframe met all test points on the first test; a testament to the structural integrity of the aircraft.

- Eclipse worked with specialists from 10 different FAA Aircraft Certification Offices (ACOs) and cross-functional FAA departments. The company was among the first to follow the FAA Certification Process Improvement (CPI) program. Detailed FAA involvement in a certification process is a hallmark of the CPI program.
- The CPI program allows the FAA to focus on safety-critical or unique design features as they are being created. Eclipse shared these and the preliminary design concepts of the Eclipse 500 with the FAA well in advance of the flight testing portion of the certification process.
- From the company's inception, Eclipse has intended to conduct its own flight training curriculum to ensure a stringent and thorough process is followed to meet all FAR Part 142 requirements. Eclipse is the first U.S. aircraft manufacturer to employ a FAA-approved Flight Operational Quality Assurance (FOQA) program for its pilots and customers. FOQA is a voluntary program involving the routine analysis of aircraft data for operational risks and has been identified as a key contributor to superior safety records in Part 121 scheduled air carrier Safety Management Systems (SMS).

Challenges in Achieving Type Certification (TC)

The FAA type certification process for a new aircraft is the culmination of years of hard work from hundreds of people from many companies and government agencies. Gaining certification requires hundreds of certification tests and substantiation reports and thousands of testing hours conducted under the scrutiny of the FAA. Our certification process for the Eclipse 500 was instigated long before I came to Eclipse. As a result, there may have been several personnel changes during the course of the process that I and other members of the current Eclipse Aviation leadership team were not aware of.

Eclipse cooperated fully with the FAA during the certification process we undertook. We received the provisional type certification (TC) for the Eclipse 500 in July 2006. It had been the intention of Eclipse management to reach full type certification in time to announce this milestone at EAA's AirVenture in Oshkosh, Wisconsin. Shortly before AirVenture it became evident that the Eclipse 500 would not achieve TC by the event because we had not yet demonstrated compliance to every regulation, specifically the fuel tanks on the wing's tip. Thus, Eclipse requested and received a provisional TC based on what it had accomplished.

Receiving the provisional TC was a significant milestone for the company because it demonstrated to our customers and our employees just how close we were to finishing the entire type certification process. Eclipse never used this provisional TC for any other purpose than as a milestone. We did not present any aircraft for a Certificate of Airworthiness (C of A) or operate any aircraft under the provisional TC.

Two months later, Eclipse was indeed able to show full compliance to the regulations and the Eclipse 500 received the standard type certificate on September 30, 2006.

Challenges in Achieving Production Certification (PC)

To receive a Production Certificate (PC) a company must demonstrate that it has rigorous manufacturing and quality processes in place to repeatedly produce the design that was certified. A company is not required to obtain a PC to produce airplanes. It was Eclipse's intent to obtain a PC directly after the TC. However, Eclipse and the FAA worked through a number of challenges before receiving the PC on April 26, 2007; seven months after receiving the full TC.

In hindsight, it is not surprising that it took us seven months past our TC and more than a year in total to receive our PC. We were a new company with a new design, new manufacturing process and, although most had extensive previous experience, we were a combination of people working together for the first time. We experienced challenges getting all of these processes working in unison.

In addition, it is rare for a new PC to be granted and therefore the experience with such things is limited within the FAA. We believe that the FAA did not initially have the people with the appropriate knowledge and experience assigned to our PC team. After repeated contradictory directions and lack of clarity around the approval process, Eclipse management expressed concern to FAA senior management that ongoing issues affecting granting Eclipse's PC were not correctly addressed. The FAA assigned an independent board comprised of technical personnel with exceptional experience to oversee the PC process — with the assistance and full involvement of the existing FAA leadership. Together, Eclipse, the independent and experienced board and our assigned FAA officers executed the PC project plan as outlined in the FAA regulations. After demonstrating compliance to the regulations, we were granted our PC on April 26, 2007.

Approval of Our Pilot Training Program Through the Flight Standards Board (FSB)

FAA regulations require that a pilot of a jet aircraft must be rated in that type of aircraft. This is called a Type Rating. A Flight Standards Board (FSB) is convened by the FAA once an aircraft is certified to evaluate and approve the pilot training program for a particular aircraft. The Eclipse 500 program was no different. To date 375 people have passed their FAA check ride and have received their Eclipse 500 Type Rating.

There has been much discussion regarding our interaction with the FAA's FSB. Between September 23, 2006 and December 13, 2006 Eclipse experienced two false starts with the FSB. On these two occasions Eclipse proceeded through the FSB process with a premature aircraft and the FAA correctly ceased the process until a completed aircraft could be presented. However, between January 16, 2007 to January 26, 2007, Eclipse provided the FSB with a complete and reliable production aircraft. With this aircraft the board was able to complete its evaluation of the pilot training program for the Eclipse 500.

It's important to highlight that during this timeframe, Eclipse was still a developing and young company coming to grips with aircraft production best practices. At the time, we did not fully understand the value of using a fully production representative aircraft for this approval. In hindsight, a more prudent course would have been to attempt approval once our aircraft matured to a certified level.

In-Service Experience of the Eclipse 500

Again, in more than 5,000 flight test hours, more than 32,000 total fleet flight hours, 21 months of customer deliveries and with more than 250 aircraft delivered, no injury or fatality to any Eclipse 500 pilot or passenger has occurred. No other aircraft in two decades has entered service with a better record. However, as with any new design, we have had issues with the reliability of some of our systems and components.

There are several ways to document the initial in-service record of a new aircraft.

- A Service Difficulty Report (SDR) is required by FAA Part 135 regulations for on-demand air carriers and Part 121 scheduled air carriers to report the occurrence or detection of failures, malfunctions or defects in an aircraft concerning 16 very significant events. By contrast, most privately operated aircraft, such as business jets, are not subject to the same stringent reporting requirements. The FAA instituted the SDR process to analyze and identify safety trends. An aircraft operator sends the SDR to the FAA for recording.
- A Service Bulletin (SB) is a path for aircraft and systems manufacturers to alert operators and customers to a change or update to an aircraft or how it is operated. Manufacturers can issue an SB to proactively inform operators and customers of changes or updates. Manufacturers are responsible for notifying operators and customers of an SB and its requirements.
- An Airworthiness Directive (AD) is the only mechanism that the FAA can use to mandate a change or inspection of the type design for aircraft that have already received a standard Certificate of Airworthiness. When an AD is published, the FAA sends the AD to all U.S. registered owners of an aircraft.

Service Difficult Reports (SDRs)

To date, 94 SDRs have been filed by Eclipse 500 operators since the aircraft was certified. Ninety-three (93) of these were filed by DayJet Corporation, the largest operator of the Eclipse 500 (28 aircraft) and the nation's first per seat, on-demand air taxi service.

Eclipse has analyzed the 93 SDRs submitted by DayJet and has concluded that only one meets the requirements of an SDR. It is our assessment that DayJet went beyond the required reporting requirements of significant difficulties and chose to report through the SDR process additional maintenance events and other issues. We believe DayJet did so out of an overabundance of caution and a certain amount of inexperience with the SDR process in an effort to build robust communications with its FAA Flight Standards District Office (FSDO) in Washington D.C.

Eclipse, as required, has a very robust process in place to review, disposition and act upon all SDRs. Our SDR review process is performed on an ongoing basis by a cross-functional group familiar with the design of the Eclipse 500. This group includes engineers, aircraft system leads, and Designated Engineering Representatives (DERs). The group makes individual recommendations for dispositions of the SDRs to the FAA. To date, 59 of the 94 SDRs have been recommended for closure to the FAA.

NTSB Investigations

Since entering service the Eclipse 500 has been the subject of two investigations by the National Transportation Safety Board (NTSB). The preliminary reports have been released on both; one is classified as an incident and one as an accident.

The incident occurred on June 5, 2008 at Midway Airport in Chicago, Illinois. The root cause of this incident was a flaw in the requirement for the software logic in the engine control system. This requirement was established at least two years prior to certification of the type design. The aircraft system during the incident performed exactly the way the software had been designed and certified to perform and was not the result of any hardware failure. Two teams of experienced engineers at Pratt & Whitney Canada (the engine manufacturer) and Eclipse Aviation — plus two certifying agencies: The FAA and Transport Canada — missed this requirement flaw. It was simply human error. Eclipse Aviation, along with the FAA, has taken action to ensure the continued safe operation of the Eclipse 500 while changes are being made to the software logic.

The accident occurred on July 30, 2008 in West Chester, Pennsylvania. A pilot operating an Eclipse 500 overran a runway at Brandywine Airport while landing. The preliminary NTSB report states that “No preimpact mechanical failures of the flight control system, brake system, engine control systems, or engines were discovered.” After leaving the runway, the aircraft traveled down a 40-foot embankment and crossed a service road before coming to rest against a bank of trees and a chain link fence about 184 feet past the end of the runway. The aircraft was substantially damaged, yet the pilot and his young child were not injured. In fact, the aircraft cabin interior showed almost no signs of damage. This is a further testament to the design integrity of the Eclipse 500.

In Service Reliability and Improvements

The responsibilities of introducing a new aircraft are immense. Eclipse employs a variety of methods and systems to mitigate and prevent any service issue and to continually improve our aircraft. The aircraft possesses an electronic ecosystem that, for the first time in a FAR Part 23 aircraft, supports real-time communication about operating parameters. Thus, DayJet, as well as other Eclipse 500 operators, are now receiving data from the aircraft’s advanced software and technical systems regarding systems health, troubleshooting and fault isolations. The aircraft’s systems and equipment were designed to prevent cascading failures and limit the effects of single failures to manageable results. Extensive fault insertion testing and safety analysis prevents serious failures in the aircraft systems and equipment. The positive results of this design assurance program

have been proven throughout the continual examination of in-service difficulties of the Eclipse 500.

Eclipse employs a number of internal methods to identify, analyze and address in-service difficulties to ensure the continued airworthiness and safety of the aircraft. Two of the most notable are the internal Safety Review Board (SRB) and the review of the previously mentioned Service Difficulty Reports (SDRs).

The SRB consists of representatives from Flight Operations/Safety, Aircraft/System Safety, Quality Assurance, Engineering, Certification and Customer Support. This group also involves additional specialists for each situation and develops required containment actions for fielded aircraft concerns. In addition to the SRB and SDR reviews, an internal Reliability and Maintainability group evaluates the overall reliability of the aircraft and performs in-depth Root Cause and Corrective Action (RCCA) analyses as part of our overall Failure Reporting and Corrective Action System (FRACAS). The outputs of these efforts drive changes to the production process and, in some cases, design changes to improve the reliability of the aircraft.

Summary

Eclipse Aviation is dedicated to ensuring our aircraft and customer pilots are the model for general aviation safety. We have challenged the industry status quo by embracing technology and programs enabling comprehensive data collection, while shouldering the responsibility of continuously and proactively improving the Eclipse 500 and how it is operated. As a result, the Eclipse 500 was built to deliver exceptional safety performance. Its standard safety features rival those of aircraft costing millions of dollars more. The state-of-the-art Eclipse 500 cockpit is designed for safety through the redundancy of vital systems and its ability to reduce pilot workload.

Mr. Chairman and Members of the Subcommittee, Eclipse did something no other company has accomplished. We developed a truly revolutionary aircraft and created a new market segment that helped return relevancy and growth to general aviation. In the process, we created something much more difficult than an airplane; we created a blue chip company with more than 1,000 employees, all dedicated to building the best jet in the history of general aviation. We look forward to delivering unprecedented performance, reliability, training and service to general aviation and to our customers for many years to come.

Thank you for your time today. I will be pleased to answers any and all of your questions.

Respectfully submitted,

Peg Billson