Written Statement

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Aircraft Certification: Alleged Regulatory Lapses in the Certification and Manufacture of the Eclipse EA-500

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The FAA's Rotorcraft Directorate, has conducted itself in an ethical, honorable and professional manner in the matter regarding the Eclipse Aviation Corporation (EAC) Eclipse 500 jet. The employees involved in the Eclipse 500 certification as well as their fellow FAA employees from around the country are the finest employees I have had the privilege to serve with. There have been characterizations regarding professional competence and conduct that are unfair and unmerited.

As the Manager of the Rotorcraft Directorate, I was ultimately responsible for the engineering compliance oversight of the Eclipse 500, lead by Ms. Owsley. Likewise my role was similar in the oversight of the production/manufacturing aspects of the Eclipse 500.

The Eclipse jet is a novel jet in this day. However, the company is still required to demonstrate compliance to the Federal Aviation Administration rules regarding both design and production.

The events, which I will describe, regard a Department of Transportation Inspector General investigation into the inappropriate influence by FAA officials in both the EAC 500 Type Certification and Production Certification programs.

In August 2006, I was directed by the Director, Aircraft Certification Service to personally become involved in the Type Certification program of the EAC 500. This can differentiated from the 250 other programs within the Rotorcraft Directorate and my earlier position in the Engines and Propellers

Directorate, where I rarely had this type of either direction or Washington involvement.

The events leading to EAC 500 problems are numerous and somewhat complicated. I will as best I can simplify this portrayal. EAC was a brand new company that was trying to make a big splash in the aviation industry. Articles in various trade publications and interviews the Chief Executive Officer, Vern Raeburn created a very public and well documented awareness of the EAC 500.[1,2] Vern was even a keynote speaker at the Aircraft Certification Services' all-mangers meeting. However, they were befallen by an engine design issue that could only be solved by a completely new manufacturer. Imagine if you will, you have placed an order for a new 2009 automobile only to find that the promised power plant must be changed and you will have to wait – and the company still holds your financial deposit.

This was a company that aspired to go from a production rate of zero to 150 in the first year (2006) and 600 their second year (2007)-- Unheard of in the aviation industry and unrealistic. Further, this was a company that wanted to gain its engineering approval – aka TC, its production approval or PC, its Repair Station Certificate and have aircraft awarded their Standard Airworthiness Certification all within 15 days. That would similar to a student going to college for 4 years and expecting to get two BS's and a Master's all the same day -- Possible – but highly unlikely. No amount of FAA "coaching" would dissuade EAC executives and staff that this feat was not practical and overly ambitious. This did not stop the public proclamation of 31 March 2006 Type Certification date by EAC in both

Business and Commercial Aviation and *AOPA Pilot* magazines. During a July 2006 visit to EAC the FAA Administrator was briefed on the March 2006 TC date by Vern Raeburn; this created an additional "atmosphere" of expectation[3]. Mr. Raeburn's casual mention of several high ranking state and federal officials only raised our awareness of the political clout that could be brought to bear.

EAC had over the previous years, established a legacy of not meeting its commitments to the FAA. EAC rarely submitted a report on time, yet had the gall to drop a report on the FAA and want approval immediately. It was not uncommon for other FAA offices to tell the Ft. Worth Airplane Certification Office that they would not be able to forward an approval till a date that was well beyond what EAC was telling the Ft. Worth FAA offices. As a test pilot, I was also very concerned at the turnover in the test pilot community. During this program the FAA dealt with at least four different "chiefs" of flight test or similar titled persons. This certainly created an air of concern on the part of the FAA. As one company test pilot shared with me, ***his integrity test light had been pushed way too many times***. Each event in and of itself would not necessarily be concerning, however when you couple all this together – the pattern of misinformation, missed dates and a willingness to go straight to Washington DC left the field FAA personnel in a very untenable situation.

When it became apparent that EAC would not receive their TC by Oshkosh 2006 (EAA AirVenture) they requested they be granted a Provisional TC –

this caused the FAA to stop all work on the TC effort and focus resources on meeting this request.

On 14 Sept 2006, a late afternoon meeting was convened with the FAA employees involved with the EAC 500 in an Albuquerque hotel.[4] In attendance were the pilots, inspectors, engineers and four FAA Executives among the Executives was the Director, Aircraft Certification Service. It was completely clear to all FAA employees present that the current approach to the software certification on the EAC 500 was not going to meet the EAC 500 calendar schedule or the Service Director's timetables. As an aside, during my Software class at the Defense Systems Program Management course we were taught that software should be event driven not calendar driven. And, any software program with a calendar schedule – run the other way. The field FAA experts were justifiably unconvinced of EAC's ability to perform.

In this 14 September meeting, the FAA Software Engineer, Mr. Wallace tried to convey to the Service Director that the EAC approach would not follow the established FAA procedures and was sorely lacking in meeting the Agency's established and time-tested software certification procedures not to mention EAC and their vendor never meeting a calendar date for a data submission. Mr. Wallace was summarily subjected to a verbal barrage that conveyed that he, Mr. Wallace was not able to think "outside the box". It was at this point that I interjected myself between my staff employee and the Service Director. My "taking up" for him resulted in my dressing down and a humiliating verbal assault in front of my subordinates and peers. In 35

years of public service as an Army officer and FAA employee I have never suffered an experience as denigrating or unwarranted. It was clear to those present that Mr. Hickey was passionately making the case for thinking outside the box, however, the box must still be within the bounds of regulatory compliance and appropriate risk management. I have heard this Albuquerque meeting characterized as Mr. Hickey's passion for meeting customer needs and thinking outside the box – I would characterize it as an assault on our professionalism and our character.

Every FAA employee left that meeting with a clear picture that it was our responsibility, the FAA and not Eclipse to find a solution to the software issue. One was found. EAC and the avionics manufacturer would make attestations to the FAA that the software architecture had no "unsafe feature" and did "its intended function." A question that is fair to ask: Is it safe? The answer was yes. There was no incident that was not managed and/or mitigated by the cockpit procedures or the fact the aircraft could only fly in daylight and clear of clouds and no aircraft would be delivered to customers. The FARs only requires a minimum level of safety – EAC met this burden. By analogy, it would similar to the new car that can only be driven on dry country roads, no interstates, in day light conditions and you have to have a driving instructor with you.

The following week, the final Type Certification Board was held. The FAA agreed to numerous IOUs from EAC – this is not uncommon but the FAA personnel were under a great deal of pressure to meet the EAC target date of 30 September 2006.[5] What many of us were unaware of was the contractual

obligations to creditors that EAC had agreed to. Among these was that financial backing was contingent on gaining the FAA airplane Type Certificate within 30 days of Pratt & Whitney getting their FAA TC for the engine. Also, there were stock options/employee benefits tied to meeting dates. These items did not come to light until very late in the program and were extremely unsettling to many FAA employees not to mention the morale factor.

In the spirit of full disclosure - during my tenure we did help other companies in a comparable manner – our approach was "no harm no foul." If all the Federal Air Regulation compliance findings were made and all the Agency was waiting on was a formal report submission, and being legalistic about the submission would cost the company millions of dollars and the very livelihood of the employees -- we would accommodate the applicant.

There were other issues that were "floating" around this effort that FAA personnel were aware of. The FAA became privy to a mis-sent email detailing an EAC strategy to use the Service Director's influence in the software certification issue.[6] It would be fair to note that no evidence exists that the email was ever sent to Washington. However, it served notice to the FAA project employees that no Eclipse tactic was "out of bounds." Further, it became clear that EAC was prepared to go to the mat regarding the DO-178B software compliance. Their mantra was that DO-178B was not binding in a regulatory sense.[7] This was correct – however, at this point in time, there was no other means of software compliance that the FAA had agreed to. If the FAA were to have agreed up front to the EAC approach,

this method of compliance would have been properly staffed via an Issue Paper through the appropriate policy offices in the very beginning of the program. The FAA project team was trapped between Eclipse and the Service Director and we knew it. There was no chance that an Issue Paper would have been considered at this *11th hour* considering the pressures and "influence" faced by ACO personnel.

The EAC IOU for the avionics software was 15 Oct 2006. [8] The TSO approval for the avionics was finally granted on 23 March 2007 – some six months later.[9]

The production and manufacturing program suffer some of the same ills as the Type Certification program. In many respects, production is harder than the engineering. Engineering can change a design in a computer and generate a report – production involves suppliers, tooling, bricks and mortar, purchasing systems, storage, trained personnel, parts qualification, documentation and a quality system that will insure that each and every aircraft conforms to the Type Design data and is in condition for safe operation.

The FAA-mandated quality system is extremely thorough. The FAA system has insured that aircraft manufactured regardless of the size of the company are airworthy. The production and manufacturing issues at EAC were typical of a new company. EAC was trying to do too much with inadequate processes, controls and trained personnel.

From the time that EAC received their Type Certificate their focus became their Production Certificate. However, prior to the awarding of the TC, FAA inspectors had been doing ongoing inspection of Eclipse's quality system. In fact, FAA Inspectors completed a District Office audit prior to the award of the TC that documented numerous non-compliances.

The basic state of affairs post-TC was that Eclipse was not qualified to receive a Production Certificate. There were numerous issues. In order for an aircraft to be prepared for customer delivery and award of an FAA Standard Airworthiness Certificate, there are a series of Functional Test Procedures, 36 if I recall correctly that must be successfully completed. The Aviation Safety Inspectors from the Directorate spent an extraordinary number of hours editing and auditing these proposed procedures. There were numerous accounts of procedures being incomplete, the procedures not accurately or thoroughly evaluating the system and special tools not being called out in the procedure. There were numerous documented examples of EAC personnel signing off Functional Test Procedures as complete, in other words the aircraft systems passed. When FAA personnel followed up, the **systems failed to pass the procedures**. This further exasperated the situation. EAC was very vocal about the FAA being overly detailed. The FAA role is to oversight the FAA designees. It was established that EAC management was working around the EAC Organizational Designated Airworthiness Representatives or ODAR. By example, an aircraft was closed up -- that is floors installed prior to the ODAR inspecting the aircraft. When the Eclipse ODAR queried if the inspection of under-floor fuel lines, control cables, electrical cables and clamping still must accomplished? The

FAA responded – yes. This meant that the interior floor had to be removed to allow the required inspection. The FAA employees were "blamed" for this mismanagement of the workflow.

The quality system at Eclipse was in disarray. The personnel turnover, lack of personnel, pressures to have airplanes ready to sell post-TC award kept the company in a state of constant change. It was apparent to FAA personnel that ODAR personnel, persons acting on behalf of the FAA were being harassed and hassled for trying to meet the FAA standards.

In early March 2007, I received a phone call from the Director and Deputy Director of the Aircraft Certification Service regarding the documentation requested by the FAA to support the issuance of Airworthiness Certificates for the EAC 500 aircraft. The Eclipse CEO, Vern Raeburn had called the Service Director to complain that the FAA was making unreasonable records requests. An email from Mr. Lauer, San Antonio MIDO Manager to EAC, Mr. Dwight Byars had been sent to appraise EAC of FAA expectations.[10] From that phone call and I paraphrase: "Vern wanted to know why does the FAA want the @#$% @#$% sealant records?" At the time, I did not know the answer and I informed the Service Director that I would find out. It was on this same telecom that I was informed that Mr. Ron Wojnar would assume oversight of the production/manufacturing issue with Eclipse and I was relived of those duties. Back to sealant records – After consulting with the experts on this I discovered the sealant records have to be examined to insure that the shelf life has not been exceeded. Ordinarily, the shelf life of sealants would be insured by the Production Certificate quality control

system – a system that Eclipse was unable to demonstrate. It is appropriate to point out this phone call event was in reference to aircraft Serial Number 3. This aircraft had previously been rejected for its airworthiness certificate and this records review was required for the FAA re-inspection. The manufacturing office manager, Mr. Lauer in his email to EAC was putting into writing the records for review in conjunction with the physical inspection of the aircraft that are required by FAA Order 8130.2F and 14 CFR part 21. The Eclipse furnished records for Serial Number 3 showed 393 deviations from the type design. Although many of these were small or minor deviations, this was a properly conducted review.

Regarding my being "relived", at this point I felt it would only validate what we were doing and have "Washington" come in and experience first-hand what had been going on with the FAA's efforts with Eclipse. We had been following FAA Orders so: What was the downside to a third party looking into the issue? I was sorely naïve and the result highlighted an ethical climate that was unsettling.

There is an ***EAC Production Certification Report*** generated by Mr. Wojnar to the Ms. Baker, the Deputy Service Director.[11] It contains data that portrays a story that is accurate in some regards but also has a slant and factual inaccuracies that would make the Aviation Safety Inspectors from the Rotorcraft Directorate look overbearing and zealous. It also contains misleading statements regarding myself and the Rotorcraft Directorate staff. It should be noted that verbal reports from Mr. Wojnar to me on 6 March 2007 (and I have the notes) and my staff did not reflect the same content as the written report.[12] This report was only recently made available to

Rotorcraft Directorate personnel after the notice of this Subcommittee Hearing. I requested this report from Ms. Baker back in the summer of 2007 and she denied that request.

The FAA Manufacturing Inspection District Offices will normally conduct District Office audits to ascertain the readiness of an applicant for a PC inspection. The first of three FAA District Office audits showed that Eclipse had numerous areas that needed improvement. The subsequent audits had numerous write ups. The last of the three audits, out-briefed on 16 Feb 2007, documented 70 non-compliances. At the completion of the out-brief with Eclipse management, the Chief Operating Officer was informed by myself that a lot work was required. I had further conversation with the COO the following morning. We estimated it would take 3-6 months for Eclipse to make the necessary corrective actions. It was three months to the day when Eclipse was awarded their Production Certificate.

These issues detailed are but a few of the issues the FAA employees dealt with. The bigger cultural issue was the demonstrated lack of confidence in the field FAA employees by Mr. Hickey and others. This coupled with the access Eclipse had to senior leadership and the inability to have a balanced story portrayed was a gross injustice. The FAA inspectors, engineers, and pilots deserved better. It goes without saying you will hear a different story from your subsequent panel. In fact, I expect to be maligned, disparaged and at best displayed as incompetent – I will let the record speak for itself.

I will survive this event. The bigger concern is the tarnished reputation of the FAA employees involved particularly the ones who tried to raise concerns. It was my duty as the leader of the Rotorcraft Directorate to insulate the staff from the "unfairness". The FAA team "felt" undermined and threatened by having their decisions questioned from Washington. This poisoned the atmosphere and morale was terrible. There are 250 other companies the Rotorcraft Directorate oversees – no other similar set of circumstance comes close to this situation. In fact, the final Quality Management Review conducted prior to my resignation, as I recall had over 30 Positive comments from customers.

Integrity is something I learned at the feet of my father - a 28-year career Army officer. I was an Eagle Scout and served over 20 years in the Army as an enlisted soldier, a Warrant Officer and Commissioned Officer, I have three brothers that are officers in the Armed Forces. One brother is a serving Inspector General. My son is in the Army as well. Integrity is at the root of our desire to be public servants.

When leadership gives more standing to the applicants than the FAA professionals, especially given the track record that was well-known, it undermines the role of the FAA in performing its government oversight function. I have made mistakes in my career – but the handling of the EAC 500 program is not one of them.

My decision to leave the FAA was reached over a year ago and was not the EAC 500 program. It was clear to me that my value system and leadership

style were in conflict with senior leadership. It was time to close that chapter and move on.

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[1] Business & Commercial Aviation EAC Jul 05

[2] AOPA-Pilot EAC Article Jul 05

[3] PowerPoint Briefing, EAC CEO to FAA Administrator, 11 June 2005

[4] Email, Michele Owsley to FAA personnel, subject: FAA only meeting Albuquerque, NM. 9/13/06

[5] Final Type Board PowerPoint presentations from EAC, (Avionics-Electrical, Mechanical systems, Interiors-Flammability, Power plant and fuel systems. 21 September 2006.

[6] Email, Ken Harness to EAC Executive Management, subject: EFID TC plan 8-31-06.doc, date: 31 August 2006

[7] Letter, EAC to FAA, subject: Response to FAA Ft worth ACO Letter, date 8 September 2006

[8] Personal notes, EAC meeting with David Downey 1 September 2006

[9] Letter, FAA, Boston ACO to Avidyne Corporation, subject: TSO Authorization, C2d, C3d, C10b, C43e, C44b, C47, C49b, C55, C95, C113, and C139 for AVIO Multifunction Display. 23 March 2007.

[10] Email. From Mr. Lauer, FAA to Mr. Byars, EAC, subject: Airworthiness Inspection, P-2 & P-3. dated: 2/26/07.

[11] Report, Mr. Wojnar to Ms. Baker, FAA Report, ECLIPSE AVIATION CORPORATION, Production Certification

[12] Notes, Telcon with R Wojnar and David Downey, 6 Mar 06