

## United States Aviation Academy Program

This paper was offered by John Allen to the industry on or about October 2011 to express his personal views and does not represent the position or views of the Federal Aviation Administration

### **Executive Summary**

This country relies very heavily on air travel. It has grown in economic and cultural influence to the point that our society relies on it as it would any utility. However, the availability of air commerce is in dire jeopardy. Unless significant steps are taken, the U.S. commercial aviation industry will not have pilots and mechanics in sufficient numbers to satisfy demand. This skills gap will have significant repercussions on the U.S. economy and is not something to turn around quickly. In this paper, I propose to establish a United States Aviation Academy Program (USAAP). USAAP is intended to select deserving students into a rigorous four-year aviation-oriented scholastic and certification program that will produce pilots with a bachelors degree and a Commercial Pilot's License (with Multi-engine and Instrument rating). The budding pilot would graduate from the program with a college degree and certificates/ratings to start them on the path of an aviation career while only requiring them to contribute 16% (roughly \$24,000) of the cost of their education. The remainder of the education costs for each student would come from contributions by the aviation industry (30% - @\$45,000), the government (30% - \$45,000), participating college/university (20% - \$30,000) academia and private philanthropy (4% - @\$6,000). Unlike national aviation academies in other countries that put their aviation students through a program in one physical institution, the USAAP would use U.S. academic institutions that have robust aviation-oriented academic and certification programs (eg. Embry-Riddle University, Perdue University, University of North Dakota, Auburn University and others). The goal of this program is to graduate approximately 1,000 commercial pilots and 500 mechanics per year. This program is envisioned to be rigorous, including summer programs and internships as well as attrition (approximately 10%). The pilots and mechanics produced from this program will not only go a long way to fill the "skill gap" but will provide well-rounded, intelligent aviation leaders to facilitate the growth of the aviation industry for the future.

### **The Problem**

According to a recent Boeing study, "The signs of a global pilot shortage are mounting as airlines expand their fleets and flight schedules to meet surging demand in emerging markets. Asian airlines in particular are experiencing delays and operational interruptions due to pilot scheduling constraints. The forecast doubling of the worldwide commercial fleet emphasizes the increasing need for well-trained aviation personnel.

The largest projected growth in pilot demand continues to come from the Asia Pacific region, with a requirement for 183,200 pilots over the next 20 years. China's expected requirement for 72,700 pilots is the region's largest. Europe will need 92,500 pilots, North America 82,800, Latin America 41,200, the Middle East 36,600, Africa 14,300, and the CIS 9,900."

There are about 54,000 pilots working for major airlines, nearly 19,000 regional airline pilots and about 2,500 qualified pilots available for hire in the U.S. today, said aviation consultant Judy Tarver, a former pilot recruiter for American Airlines. She estimated that airlines will need to hire about 42,090 pilots over the next decade, due to retirements and anticipated industry growth. That said, Unmanned Aviation System (UAS) technology is also growing and will provide some relief to the pilot shortage. It is also hoped that approximately 30% of this needed us fulfilled by retired military pilots. Therefore, it is anticipated that the civil pilot training community will need to produce over 2,000 pilots per year.

As conditions currently exist, it is doubtful that the civil aviation community can produce this many pilots. Fewer college students say they want careers in aviation because they see it as an economic dead end, and airlines are increasingly having to compete with corporations for pilots.

The cost of attaining the requisite pilot certificates has become prohibitive since the earning potential of new pilots is very low. For example, a private pilot license costs over \$10,000. A commercial pilot certificate costs an additional \$1,000 - \$1,500. However, the certifications necessary to get hired by an airline to "fly commercially", would include a multi-engine and instrument rating in addition to the commercial certificate. Therefore, the total cost for that runs about \$30,000-\$45,000 depending on how quickly the pilot moves through the training curriculum and their aircraft rental rates.

Add the cost of a Bachelors degree (approximately \$100,000) to the certificate costs and the loans necessary to pay off the \$150,000 education/certificate costs is daunting.

In May 2008, median annual wages of airline pilots, copilots, and flight engineers were \$111,680. The middle 50 percent earned between \$81,580 and \$150,480. Median annual wages of commercial pilots were \$65,340 in May 2008. The middle 50 percent earned between \$45,680 and \$89,540. The lowest 10 percent earned less than \$32,020, and the highest 10 percent earned more than \$129,580. However, the starting pay as a first officer at a regional airline is approximately \$28,000. It takes several years to climb to a position with seniority to earn a reasonable living wage much less being able to pay \$150,000 education loan.

The economics of producing skilled pilots make for difficult competition with other career choices available to young adults.

Added to the problems of economics for developing new commercial pilots is the need to improve the training. The changing nature of aviation is requiring pilots with better training in fundamental aviation to include acrobatics and glider flying. Also, future pilots will need enhanced skills in abstract thinking, decision-making, workload prioritization, communication and risk management to keep up with the sophistications of future cockpits and airspace management systems. It is already evident that those pilots holding a 4-year degree from a college/university are more successful in commercial pilot evaluations. Their success rate is attributed to the mental rigors offered by a college curriculum above that required for pilot certification curricula.

Yet, to increase training requirements would add to the already high expense for pilot certification.

### **How This Problem Is Addressed Internationally**

Many other countries are addressing their pilot shortage by their aviation industry establishing aviation academies. One of the most notable is the Lufthansa Training Academy. This Academy is sponsored by Lufthansa to generate the pilots the company needs. Students pay for much of their training and certificates but the cost is lowered due to Lufthansa's support of the academy. Lufthansa's academy offers ab-initio training, some in the United States where training airspace is more available, as well as internships and Lufthansa hires the best graduates from its program.

The China aviation industry also employs aviation academies, also funded by the major airlines. The Chinese Aviation Authority claim that the industry academies produce over 2,500 pilots annually. Of the 2500 pilots, 1,500 attend academies within China and over 1,000 students from China-sponsored academies located outside China (eg. Australia). The

ab-initio training is usually funded by the student's family. Many of those ab-initio training schools are located here in the United States.

### **Proposal To Address This Problem - The Stakeholders**

To attract deserving and talented young adults into a career as a commercial airline pilot, I propose the creation of an aviation academy, similar to those used by Lufthansa and China. However, I suggest that the United States use existing aviation-oriented colleges and universities instead of housing this program in a single, separate academy institution. Therefore, I use the term academy program. In addition, I suggest that this United States Aviation Academy Program be funded by several stakeholders who have interest in the production of skilled pilots.

I believe the stakeholders for this program are the federal government, the aviation industry, academia and the prospective students themselves. The government is a stakeholder since the United States' economy is so reliant on a robust aviation industry. In addition, the American public depends on safe travel. Therefore, to ensure a safe and robust aviation industry, it is in the interest of the Federal Government to support the production of high quality pilots who's training is even better than pilots graduating from traditional Part 141/142 schools today.

The pilot shortage is being felt today by regional-type carriers. Those are the lower cost, entry-level carriers for new commercial pilots. The larger commercial airlines have yet to feel the pilot shortage but will feel the strain of the pilot shortage in only a few years. Therefore, the aviation industry has a vested interest in securing good quality pilots who are well educated and trained with excellent fundamental skills. It is noted that only those carriers who hire graduates from this program should be expected to invest in the program. This provides a challenge regarding industry investment.

Academia would have an interest in this program because it would bring students to participating colleges and universities that may not have attended otherwise. In addition, I believe, through economies of scale, the participating colleges/universities could provide a robust aviation-oriented 4-year degree program as well as requisite certificates through an affiliated Part 141 school, with reduced costs.

It is also important to the student to have a financial investment in the program, but not so much so that the loan repayment is daunting and demoralizing. Given the low pay for pilot at the beginning of their career, the spectre of a huge education loan repayment would dissuade many prospective students from applying to the program.

I also believe private philanthropists like the Gates foundation or through CFC, would be willing to donate to this program. This program would have a direct impact on the betterment of lives of Americans and have a beneficial impact on the U.S. economy and society.

### **Proposal To Address This Problem - The Curriculum**

This program envisions a 4-year degree program that is focused on aviation but also ensures an academically well rounded graduate. The program is envisaged to include a sound foundation in mathematics and science that assists students in learning more sophisticated aspects of aviation. In addition, classes that stimulate abstract reasoning, logic and understanding of automation is important. It is envisaged that the program will include classes in meteorology, computer science, aerodynamics, aviation regulations, airport design, accident investigation, management/leadership, air traffic control/management and many others.

This program is expected to be rigorous and not all students will graduate from it. This is important because the program should graduate future pilots who are recognized as talented

and tested. Military pilot training programs historically have had a 30% washout rate. This program may start with a 10% washout rate. Washouts would occur if students did not maintain an appropriate grade-point average or could not pass the pilot certification/training programs in the appropriate amount of time (ie. doesn't fail training or checking periods too often).

Since current pilot training curriculums are falling short of adequately training pilots for the future, it is envisaged that this program will provide more robust training in fundamental aviation skills. In addition to the traditional curriculums provided for private and commercial pilots there needs to be more training and possibly checking in acrobatics (improves skills to recover from unusual attitudes) and glider flying (improves skills of energy state management).

The summers for the students should include internships in the aviation community to learn more about their chosen profession. In addition, the students should attend a training camp that instills motivation with guest speakers and a focus on instilling leadership skills.

After the graduating, the pilots would have a commercial license but would not have the Air Transport license. It is envisaged that the graduates in this program would fly with a commercial carrier that is a member of the Regional Air carrier Association (RAA) or Regional Air Cargo Association (RACA) until they have the hours for an Air Transport Pilot license.

The college and aviation certification curricula must produce pilots of higher quality and skill to make them very enticing to hire by an air carrier.

### **Proposal To Address This Problem - The Program Financing**

To fund this program, I believe it is reasonable for a shared approach between program stakeholders. Therefore, I propose the per-student contributions to USAAP be 16% (@ \$24,000) borne by each student, 30% (@\$45,000) each borne by a hiring U.S. air carrier and the government (DOT), 20% (@\$30,000) borne by the USAAP college/university attended by the student and then 4% (@\$6,000) per student covered by contributions by private philanthropy (eg. Gates foundation, CFC).

Originally, I thought that the cost for USAAP should be shared equally between the government, industry, academia, private philanthropies, the student and also labor. However, this idea has problems. Some graduates may never join a union. Also, students can't fund too much of the education costs as stated previously. As for industry investment, it only seems fair to have those airline companies who hire graduates from this program, invest in USAAP. Therefore, an industry investment plan is to have a contractual agreement with the student that they will hold a note for 30% of their education costs (@\$45,000), to be paid by a hiring airline, above the 16% (@\$24,000) the student must personally repay. When a U.S. airline hires one of the USAAP graduates, it will repay to the government, 3% of the student's industry note (@\$4,500) per year. Therefore, the industry note could easlity get paid off in the first 10 years of employment by the USAAP graduate. As an example, If the student moves from a regional carrier after 3 years, to a major air carrier, the major air carrier would have to pick up payment on the USAAP education note until it is paid off. With this payment scheme, the USAAP industry cost is shared between the USAAP graduate's airline employers over the first 10 years of their career. The graduate is responsible for paying any remainder on the industry note after 10 years from USAAP graduation.

If a USAAP graduate is employed by another government agency (eg military, HSD, Energy, etc), that government agency will pay the industry note on a per year basis as would a hiring airline.

With a need to graduate 2,000 students per year, the per-year USAAP funding by the DOT would be:

Year 1 - 2000 students starting program: contribution is \$45M (\$90K-per student/4\*2000) ,  
Year 2 - 4000 students (2 classes): contribution is \$90M  
Year 3 - 6000 students (3 classes): contribution is \$135M  
Year 4 - 8000 students (4 classes): contribution is \$180M  
Year 5 - steady-state is 8,000 students in 4 classes : contribution \$180M

Half of the government contribution will be repaid by industry as the hiring air carriers would pay back on the industry note. Academia would cut their costs for the students by 20% and the students would bear 16% of the education costs.

### **Proposal To Address This Problem - USAAP Governance**

A USAAP office, overseen by a board of directors, should be established to provide appropriate program financial management, curriculum and college approvals, student management and recruitment, and graduate tracking. The Board of Directors, chaired by government, would also include representatives from the aviation industry, academia and private philanthropy. The Board of Directors should include a student representative in a non-voting capacity. The USAAP office would manage the approvals of participating colleges/universities as well as the approval of the degree and certification curricula they use. It will also advertise for applicants, recruit for applicants and select the most deserving applicants. The office would ensure student, academic and industry payments are made and appropriate disbursements made for each student. The USAAP office would track the progress of each student. The decision to wash out any student will rest with the Board of Directors. If a student is washed out, they will not receive any more financial support for their education or certification but will not have to repay any funds received by USAAP to that point. Another extremely important role for the USAAP office is to track the progress and success of the graduates. This information will be useful to garner government funding and solicitation of interest by airlines to hire graduates.

### **Thoughts For The Future Of This Proposal**

I realize the government burden to up-front fund the program is steep. It may be more prudent to temper the initial ambition of graduating pilots from 2,000 to 1,000. Also, it may be possible to have the government costs for this program to be shared by Departments of Transportation, Education and Labor.

If this program is successful for developing and producing highly skilled pilots, it could serve as a template to produce aviation mechanics or address any other professional skill gap that may arise.