

# ICAO

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# TRAINING REPORT



# BUILDING TOMORROW

How aviation is preparing for the future



**ICAO TRAINING REPORT  
VOLUME 2, NUMBER 1, 2012**

**Editorial**

Aviation Safety Training Section  
Editor-in-Chief: Dawn Flanagan  
Tel: +1 (514) 954-8219 ext. 7997  
E-mail: dflanagan@icao.int

**Content Development**

Senior Editor: Laurie Seline  
Tel: +1 (514) 954-8219 ext. 5818  
E-mail: lseline@icao.int

**Production and Design**

Bang Marketing  
Stéphanie Kennan  
Tel: +1 (514) 849-2264  
E-mail: info@bang-marketing.com  
Web Site: www.bang-marketing.com

**Advertising**

FCM Communications Inc.  
Yves Allard  
Tel: +1 (450) 677-3535  
Fax: +1 (450) 677-4445  
E-mail: info@fcmcommunications.ca

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# Contents

04

**Message from the Secretary General**  
Rallying the African Aviation Training Community

06

**Solving Loss-of Control In-Flight through Effective Integrated Training**  
Dr. Sunjoo K. Advani of ICATEE offers a new perspective on Upset Prevention and Recovery Training (UPRT).

10

**The Purdue Approach**  
A look at how Purdue University's Department of Aviation Technology is partnering with industry and the Flight Safety Foundation to offer students a richer learning experience.

14

**Nurturing Tomorrow's Pilots**  
Johnny J. Weissmuller of the Innovation Center for Occupational Data, Applications, & Practices (ICODAP) reports on the future dynamics of US civilian-military aviation and the Virtual Flight Academy.

20

**Inspiring the Next Generation of Flyers in Sri Lanka**  
NGAP YouTube Contest winner Dev Kowsala Samarajeewa illustrates how Sri Lanka is inspiring awareness and interest in aviation among the youth of his State.

24

**Regional Cooperation**  
COSCAP-SADC Project Coordinator, Cliff Elbl discusses supporting present and future aviation needs in Southern African States.

26

**ICAO Training Report Directory Listings**

34

**Finavia's Innovative Approach to Learning Produces Surprising Results**  
Finavia ATS Specialist, Mark Blanchard shares a Finnish approach to "involved" learning.

38

**Evidence-based Training Comes of Age**  
Capt. Lou Németh of CAE discusses the use of Simulator Operations Quality Assurance (SOQA) for a more objective training analysis.

44

**Moving Toward a Sustainable Future for Aviation**  
Jane Hupe, Chief, Environment Branch, ICAO offers her perspective on how State Action Plans will help reduce CO<sub>2</sub> emissions for international aviation.

48

**Quality Systems, Training and Course Development**  
A conversation with Alfredo Paredes, Director of the Dominican Republic's Academia Superior de Ciencias Aeronáuticas (ASCA).

50

**Middle East Training**  
The Gulf Centre for Aviation Studies (GCAS) is helping to build "home-grown" talent.

# NURTURING TOMORROW'S PILOTS

## The future dynamics of US civilian-military aviation



### JOHNNY J. WEISSMULLER

is the Director of the Innovation Center for Occupational Data, Analysis & Practices (ICODAP). His non-profit specializes in large-scale occupational analysis and transfer of personnel research technology from the US military to managers and researchers worldwide. Johnny has been a member of the steering committee of the International Military Testing Association, chaired the Psychometrics Committee of the Performance Testing Council, presided as President over the Founding Chapter of the International Society for Performance Improvement, and co-founded the Institute for Job and Occupational Analysis. He currently works as a personnel research psychologist for the US Air Force and has a strategic role in reshaping its pilot selection policy for 2016. Since 2005, Johnny has been tracking Flack Maguire and the genesis of the Virtual Flight Academy for improving the diversity of US military aircrews.

✈️ Statisticians study past data to predict the future. Times, however, are changing. Today we are on the cusp of a number of trends that will profoundly affect the future of both US civilian and military aviation.

In the past, the major US airlines relied on the military as a primary source of pilots. According to a January 16, 2009 USA Today article, “roughly 28 percent of pilots hired by major US carriers in 2008 had military backgrounds, compared to around 90 percent in 1992.”

Many of these pilots are retiring. In 2007, to forestall a major loss of senior expertise, the US Federal Aviation Administration (FAA) raised the mandatory retirement age for airline pilots from 60 to 65. But, by the end of 2012, the US will again be facing a major loss of expertise through retirement.

A June 21, 2011 USA Today article predicts that “After a four-year drought of job openings, the US airline industry is on the brink of what’s predicted to be the biggest surge in pilot hiring in history.”

### PREPARING FOR THE NEW WORLD

Greater international demand by civil aviation, the availability of commercial simulators, and emerging aviation programmes at universities and trade schools may divert potential military student pilot applicants directly into the private sector. If so, the US military will be competing for, not providing, civilian pilots.

The other factor that may change the training landscape significantly is the fact that the US Military is embracing the Unmanned Aerial Vehicle / Remotely Piloted Aircraft (UAV/RPA) model.

With an aging inventory of manned aircraft and budget constrained purchases of multi-million dollar modern weapon systems, more military pilots in the future may find themselves qualified as “RPA-only”.

The FAA has the entire range of RPA issues under study. DOT/FAA/AM-07/3 addresses *Unmanned Aircraft Pilot Medical Certification Requirements* with projected application areas including surveillance, payload, orbit and transport. At present, the FAA is managing over 150 active civilian applications of RPAs in the National Air Space (NAS) as waiver-based projects. Until the anticipated boom in the RPA civilian market really takes off, prospects of transitioning from military RPA pilots to civilian aviation will remain a clouded future.

Given all the future forces reducing the attractiveness of military aviation, what can be done to offset a reduced “propensity to serve”? As the US embarks on its second century of military aviation, perhaps there is a need to reconsider some of the assumptions in the current military pilot selection and training model.

**THE LOST DECADE**

No professional league would consider introducing its top athletes to the sport at the age of 22. Why then accept this as standard practice for training US military pilots who could be flying in life-threatening missions while flying aircraft worth many millions and sometimes over a billion taxpayer dollars?

There is a full decade between the time that military pilots typically report that they first dream of becoming a pilot (age 12) and their introduction to a military flight training programme (age 22). Within this vacant decade, few opportunities to pursue a career in aviation exist except for the fortunate few.

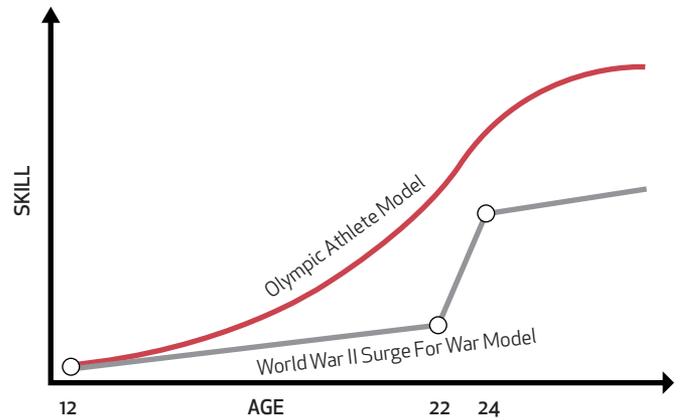
**THE VIRTUAL FLIGHT ACADEMY (VFA) VISION**

The Virtual Flight Academy (VFA) promises to be the program that saves millions in taxpayer dollars, develops far better aviation candidates, and actualizes equal opportunity for military pilot selection.

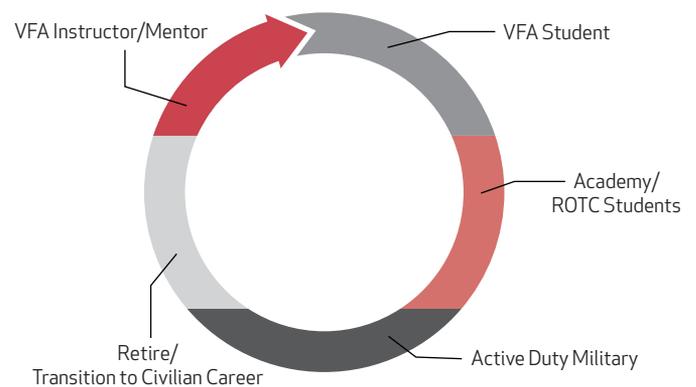
The VFA is a civilian non-profit youth aviation programme designed to address multiple issues – how to maintain or increase the influx of highly qualified US military aviation applicants and, at the same time, increase the diversity of those applicants regardless of background, race or gender.

The VFA effectively jumpstarts instruction for aspiring aviators as young as age 12. Once enrolled in the VFA programme, the VFA works with local schools, provides mentors and leverages local community programmes to sustain a long-term relationship of training and preparation with students from middle school through college.

“ ‘Luck’ is where the crossroads of ‘Preparation’ and ‘Opportunity’ meet.”  
Seneca the Younger,  
First Century AD.



Expertise Development versus Fire Hose Method



Military Aviation Circle of Training

The objective is to design a fun and stimulating environment that increases proficiency and aviation knowledge much earlier than 22 years of age.

**THE VFA MODEL**

The VFA model uses early entry flight training augmented with individualized “flight plans” to help navigate the course of non-flying requirements to a 4-year university degree in the Science, Technology, Engineering or Math (STEM) disciplines.

For those who do not see a degree programme in their future, there is an emerging career as a Sensor Operator (SO). The SO is an enlisted career field which only requires a high school diploma. The SO sits to the right of the pilot in the RPA ground stations. This is a real “at-the-front-line” job.

In the VFA programme, failure is not really an option. A key goal for the VFA is skill and character development of the student, in addition to aviation skills. Even if a student ultimately chooses to forgo the military pilot path and pursue a civilian aviation or other career, he or she will leave the VFA with an enhanced skill set and improved self-confidence to better contribute in the civilian workforce.

“The Virtual Flight Academy (VFA) promises to be the programme that saves millions in taxpayer dollars, develops far better aviation candidates, and actualizes equal opportunity for military pilot selection.”

#### VFA TODAY

Although he has been actively pursuing this vision in various ways over the past 15 years, in recent times, founder and former Naval Officer Flack Maguire kept a low public profile on the VFA concept until all the technological pieces were in place. In February 2012, Flack went public with news about progress, recent successes, and upcoming events.

#### Progress

At present, the VFA is preparing to teach its first six classes in partnership with the US Navy League Sea Cadets utilizing the official US Navy pilot introductory training course curriculum. In time, more and more flight school classes will be added.

The VFA has also tackled the issue of high-cost flight simulators by modifying low cost consumer flight simulation software to create an integrated hardware / software solution. The VFA flight simulator offers high fidelity realism, flying over digitally captured, 3-D rendered real-life terrains and specific training airfields.

To address military training needs, the system supports multi-aircraft formation interactivity with instructors and students flying together in the same virtual cockpit even though they may reside in different states.

The entire package is provided free of charge to aspiring aviators and allows students to work with seasoned former military aviators as volunteers.

#### Recent Successes

Recent successes include the launch of the VFA programme at the Wentworth Military Academy in Lexington, Missouri and plans to expand the programme to Kearny High School in San Diego, California.

The Wentworth Academy programme is run in partnership with the Falcon Foundation. The Falcon Foundation specializes in granting scholarships to students seeking admission to the US Air Force Academy.

The VFA programme at Kearny is an emerging partnership with the local Army Junior Reserve Officer Training Corps (Jr ROTC) programme. Kearny High School began its transformation from a traditional high school in 2004 to a set of smaller, special focus schools. This system of smaller schools is funded by the Bill and Melinda Gates Foundation, which supports innovative educational programmes.



Virtual Flight Academy Three Monitor Simulation Station



Virtual Flight Academy Three Monitor Simulation Station with student

**Future Events**

Flack Maguire is scheduling VFA presentations in Seattle, Colorado Springs, San Antonio, Washington DC, and St. Louis with VFA Sim-Squadron Stations to be deployed in Colorado Springs, Washington DC, and San Antonio, Texas.

**CHALLENGES IN EQUALIZING OPPORTUNITY**

Despite its best efforts over the past decades, the US military has been unable to achieve its goal of having the military pilot corps fully reflect the balance of racial and gender diversity found in the general US population.

In his book, *Talent is Overrated*, author Geoff Colvin argues that the average person is apt to “explain away” their lack of excellence because he or she did not have the luck to be born with enough talent. Colvin goes on to demonstrate that the top performers in just about every field earned this status through long-term dedicated, focused and mentored practice starting at a young age.

One of the most difficult hurdles for the VFA programme is to inspire the student to believe in himself or herself – to stick with the training programme and use mentor advice to make the right real-life decisions. “Embrace the distal vision, navigate the flight plan, live the dream.”

**THE IMPACT OF THE VFA**

The US military “ab initio” training for fighter pilots takes about a year and costs between \$1.7 and \$3.6 million per pilot. How will the VFA affect this model? This remains to be seen...

While flight hours in simulators aren’t counted in some US military pilot selection systems, the VFA programme will increase selection probabilities. VFA graduates will demonstrate improved hands-on proficiency and a greater mastery of and appreciation for aviation subjects.

In fact, the VFA simulator platform may prove BETTER than actual flying hours in the future in the RPA air space. Simulators can emulate the RPA environment by demanding more reliance on instrument monitoring because there is no audio or kinesthetic feedback.

Military selection tests also use recognition of aircraft orientations which are more appropriate to simulated aerial dogfights than to normal general aviation experiences.

The “Virtual” aspect of the VFA makes the programme scalable using Internet connections supported by relatively affordable high-end PCs for flight simulators. The VFA platform can be set up in just about any school (middle to university) in America.

**VFA & MILITARY ALIGNMENT**

Military recruitment programmes are prohibited, by US laws, from making contact with minors under the age of 17. They also prohibit any selection programme which references race or gender.



Model for Military Aviation Pre-Training

University scholarships for Reserve Officer Training Corps and admission into the service academies are highly competitive. Even when allocating scholarships by geographical regions, the quality of the local high schools can make a slight difference.

As Malcolm Gladwell explains in his book, *“Outliers”*, those who start ahead tend to stay ahead. Slight differences in apparent ability translate into more day-to-day practice opportunities and, eventually, into even faster development. This is not a case of gender or race bias, but rather of slightly better preparation winning out.

In the 1990s, the US Air Force sponsored a study into what makes a student actively seek the career of pilot. The truly “driven” military pilots reported that they first had the dream of being a pilot when they were 12 or 13 – at least four years before any military recruiter could legally approach them.

The study interviewed only those who actually survived the decade-long process by staying the course through university graduation, into the military, and finally through pilot selection and training.

These were the lucky few. As the adage goes – “Luck” is where the crossroads of “Preparation” and “Opportunity” meet.

The VFA programme is determined to provide unprecedented preparation and operationalize equal opportunity for those willing to dream the dream.

In much the same way as a young person’s basketball talent may be nurtured, the VFA is designed to provide aspiring aviators from all backgrounds with an opportunity to demonstrate their excellence and passion at a young age by developing real aviation skills.

Many recent research references on military/civilian aviation can be found at <http://www.stormingmedia.us/keywords/pilots.html>. This includes *A Bibliographic Database for the History of Pilot Training Selection* by Howse and Damos, AFCAPS-FR-2011-0010, 2011. ■