ICAO
INTERNATIONAL CIVIL AVIATION ORGANIZATION
Vol. 1, No. 1 – July/August 2011

TRAINING REPORT

The Challenges of
CONTINUOUS MODERNIZATION

Addressing looming skilled personnel shortages and the need for industry-wide technology upgrades.

In this issue:

AXIS

FLIGHT TRAINING SYSTEMS

reliable

cost effective

highly sophisticated

Full Flight Simulators

AXIS Flight Training Systems GmbH, A-8403 Lebring, Phillipsstrasse 27, Austria

phone: +43 (0) 5 9889-0, fax: +43 (0) 5 9889-115, www.axis-simulations.aero

ICAO TRAINING REPORT
VOLUME 1, NUMBER 1, 2011

Editorial
Aviation Safety Training Section
Editor-in-Chief: Nicole Barrette-Sabourin
Tel: +1 (514) 954-6728
E-mail: safetytraining@ICAO.int

Content Development
Anthony Philbin Communications
Senior Editor: Anthony Philbin
Tel: +01 (514) 886-7746
E-mail: info@philbin.ca
Web Site: www.philbin.ca

Production and Design
Bang Marketing
Stéphanie Kennan
Tel: +01 (514) 849-2264
E-mail: info@bang-marketing.com
Web Site: www.bang-marketing.com

Advertising
FCM Communications Inc.
Yves Allard
Tel: +01 (450) 677-3535
Fax: +01 (450) 677-4445
E-mail: fcmcommunications@videotron.ca

Submissions
The *ICAO Training Report* encourages submissions from interested individuals, organizations and States wishing to share updates, perspectives or analysis related to global civil aviation. For further information on submission deadlines and planned issue topics for future editions of the *ICAO Training Report*, please contact Nicole Barrette-Sabourin, Editor-in-Chief at: nbarrette@icao.int

The publishers extend their thanks to the companies, organizations and photographers who graciously supplied photographs for this issue.

Published by
International Civil Aviation Organization (ICAO)
999 University Street
Montréal, Québec
Canada H3C 5H7

Printed by ICAO

Contents

www.icao.int

ICAO Council 13/06/2011

President: Mr. R. Kobeh González (Mexico)

Argentina	Mr. J. Gelso
Australia	Ms. K. Macaulay
Belgium	Mr. G. Robert
Brazil	Mr. R. Magno
Burkina Faso	Mr. M. Dieguimde
Cameroon	Mr. E. Zoa Etundi
Canada	Mr. L.A. Dupuis
China	Mr. Tao Ma
Colombia	Mrs. G. Rueda de Higuera
Cuba	Mr. J. F. Castillo de la Paz
Denmark	Mr. K. L. Larsen
Egypt	Mr. M. T. Elzanaty
France	Mr. M. Wachenheim
Germany	Mr. J. Mendel
Guatemala	Mr. L. F. Carranza
India	Mr. A. Mishra
Italy	Mr. G. Picheca
Japan	Mr. S. Baba
Malaysia	Mr. K. Soo Chon
Mexico	Mr. D. Méndez Mayora
Morocco	Mr. A. Manar
Nigeria	Dr. O. Benard Aliu
Paraguay	Mrs. A. Torres de Rodríguez
Peru	Mr. C. R. Romero Díaz
Republic of Korea	Mr. Chong-hoon Kim
Russian Federation	Mr. A. A. Novgorodov
Saudi Arabia	Mr. T. M.B. Kabli
Singapore	Mr. B. Kim Pin
Slovenia	Mr. A. Krapež
South Africa	Mr. M. D. Tshepo Peege
Spain	Mr. V. M. Aguado
Swaziland	Mr. D. Litchfield
Uganda	Mr. J. W. Kabbs Twijuke
United Arab Emirates	Miss A. Al Hamili
United Kingdom	Mr. M. Rossell
United States	Mr. D. Woerth

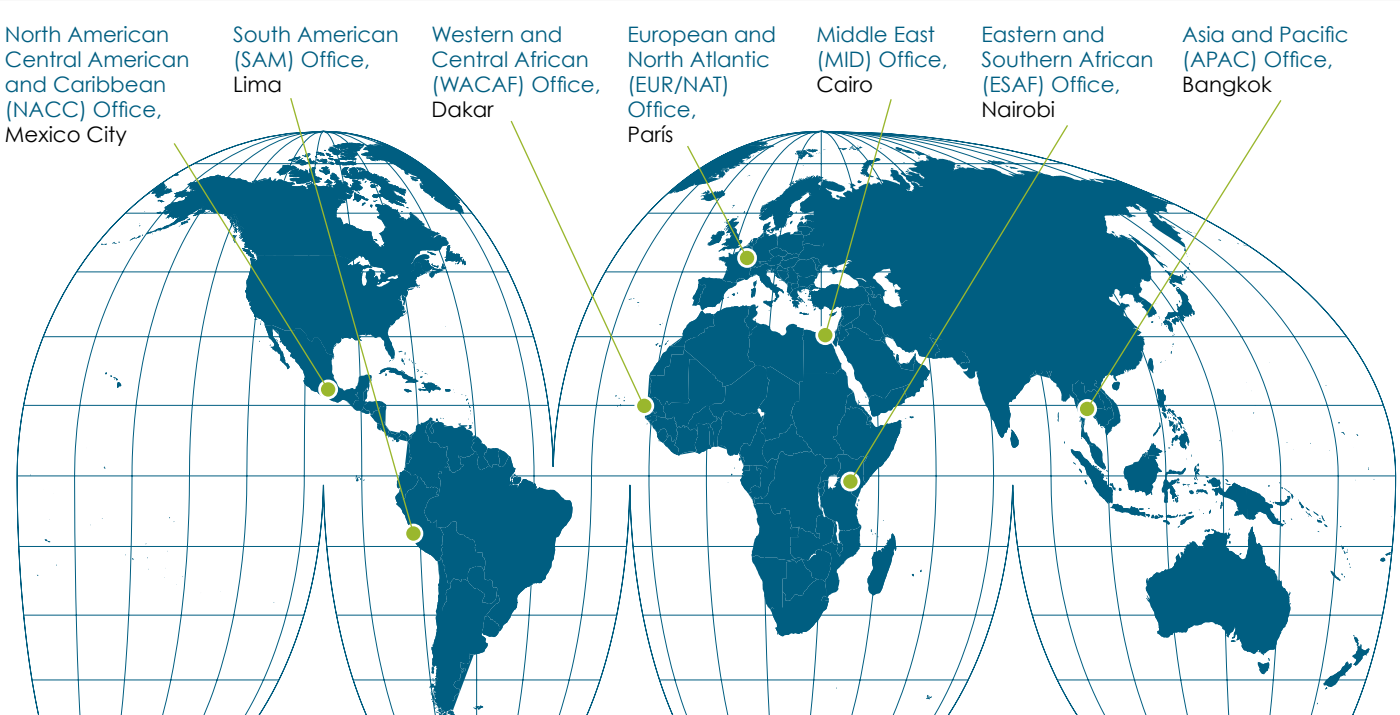
ICAO Air Navigation Commission (ANC) 13/06/2011

President: Mr. M.G. Fernando

Members of the Air Navigation Commission are nominated by Contracting States and appointed by the Council. They act in their personal expert capacity and not as representatives of their nominations.

Mr. A.H. Alaufi	Mr. S. Vuokila	Mr. R. Monning
Mr. S.C.M. Allotey	Mr. P.D. Fleming	Mr. C. Schleifer
Mr. J.L.F. Alves	Mr. R.O. González	Mr. F. Tai
Mr. D.C. Behrens	Mr. M. Halidou	Mr. A. Tiede
Mr. M-h. Chang	Mr. J. Herrero	Mr. D. Umezawa
Mr. J. Dow	Mr. A. Korsakov	Mr. F. Zizi

ICAO's Global Presence



Toward More Coordinated and Effective Aviation Training

Aviation today faces a series of pressing challenges. These include improving its excellent safety record in the face of projected traffic growth, addressing the need for increased innovation and action to ensure air transport's more sustainable and environmentally-friendly future, and taking advantage of the latest technologies and processes to make aircraft more secure from terrorist threats—even as these same technologies help deliver new levels of convenience to air travellers everywhere.

With this inaugural issue of the *ICAO Training Report,* the Organization is recognizing and reinforcing the important role that more effective training will play in the pursuit of all of these objectives.

This heightened emphasis on training strongly acknowledges that at the heart of every technology and programme which today holds out promise for aviation's safer, more efficient and more secure future stands a human agent. It also recognizes that the skills and experience these personnel must have at their disposal requires an unprecedented degree of coordination and prioritization amongst air transport stakeholders with respect to all training-related initiatives.

Since IATA first brought to light some of the more dire warnings on looming aviation personnel shortages in 2009, ICAO has begun to coordinate the sector-wide response required by this challenge through its Next Generation Aviation Professionals (NGAP) initiative.

The 2010 NGAP Symposium was in many ways a catalyst for this new *Training Report,* and the priorities this global forum and its Task Forces have helped to establish inform every topic you'll find in this and ensuing issues of our first-ever dedicated training publication.

In the pages that follow you will learn about some very successful programmes now being pursued by States and air transport stakeholders around the world. They include the more efficient and technology-driven successes being achieved with the Multi-crew Pilot License (MPL) approach as we seek to increase the pool of competent pilots available to global carriers, improved understanding of the merits of more effective Crew Resource Management (CRM) training and assessment, not to mention the significant challenges facing Air Navigation Service Providers as they seek to enhance their existing training to anticipate the significant technological and operational evolution that is now underway in virtually every aspect of the world's Air Traffic Management (ATM) system.

Also in this *Report* and its ensuing editions, you will read about the efforts on behalf of ICAO and other air transport Organizations regarding the specific programmes and approaches each is pursuing based on the common frameworks and objectives which ICAO's forums are helping aviation to achieve.

Notable in this regard for the issue at hand are the foresight and strategies exemplified in the modernized curricula of the IATA Training and Development Initiative, as well as the network of skilled airport management personnel ACI-ICAO are helping to foster through their joint Airport Management Professional Accreditation Programme (AMPAP).

Additionally, this inaugural issue features an interview with a leader of ICAO's TRAINAIR *PLUS* programme, which has gone through a significant strategic retooling. This interview highlights the improved success it is now enjoying as a result.

The role of TRAINAIR *PLUS* and endorsement programmes in helping the entire aviation community respond to the full range of its training challenges cannot be underestimated. The *Training Report* will therefore be highlighting these efforts increasingly in future issues.

As the global forum for the international aviation community, ICAO has always understood the importance of a constantly-evolving and improving training environment as a key catalyst for a more effective and harmonized global aviation system. With the launch of the new *ICAO Training Report,* the Organization is seeking to provide improved leadership and easier access to the latest information on all aviation-training developments as States and industry rise together to meet the important personnel challenges ahead of them. ■

Nancy Graham
Director
ICAO Air Navigation Bureau

The Canadian MPL Approach

The Canadian Multi-crew Pilot Licence (MPL) focuses on the competencies required of a co-pilot on a transport-category aeroplane. Not simply another licence, the MPL represents a shift in civil aviation training philosophy.

Nick Taylor, member of the ATO/MPL Implementation Team at Transport Canada, highlights that the successful implementation of the Canadian MPL programme required the development of additional guidance and validation tools and features a very proactive engagement with interested stakeholders–regarding the on-going development of the related regulatory environment and to ensure implementation of best practices.

After a career in flight training as Chief Flight Instructor, flight school manager and pilot examiner, Nick Taylor brought his training expertise along with a background in general aviation simulation to Transport Canada in 2003, serving as a Civil Aviation Safety Inspector specialized in Flight Training. Since 2007, as part of a dedicated team formed to implement MPL and Approved Training Organizations in Canada, Nick has taken the lead role as the certification specialist for ATOs. He is qualified on the Beechjet, the MPL Phase 3 aircraft for CAE's MPL beta test.

Success in Multi-crew Pilot Licence (MPL) training requires a new focus by regulators, air carriers, training organizations and trainees. These stakeholders must now concentrate more on the needed skills, knowledge and attitudinal competencies of the actual job, rather than the exclusively prescriptive minimum skill, knowledge and experience requirements of a traditional pilot licence.

In 2006, following a recommendation from its Flight Crew Licensing and Training Panel, ICAO introduced the MPL. Transport Canada, recognizing the benefits this type of programme could deliver, decided to embrace the challenge of implementing it.

Complete Pilot Training Solutions

Keep one step ahead with CAE's complete cadet-to-captain pilot training solutions.

CAE provides flexible and customized solutions designed to enhance the safety, efficiency and effectiveness of your airline:

- Candidate identification, selection, training and placement with your airline
- Ab initio training through the world's largest network of CPL/ATPL/MPL flight schools
- Type-rating training through the world's largest network of commercial aircraft training centres
- Innovative training science, regulatory support and aviation's leading suite of integrated training tools, from e-Learning to full-flight simulators

For over 60 years, CAE has been a trusted partner to aircraft manufacturers, airlines, business aircraft and civil helicopter operators around the globe.

Have a conversation with CAE about your pilot needs.

CAE

one step ahead

cae.com

conversation@cae.com

As a result, Canada has gained lessons learned and best practices with respect to introducing competency-based MPL.

As is the case for many other ICAO Member States, Transport Canada's traditional safety net, the certification requirements for Canadian flight training organizations, is well suited to the needs of our existing licences and ratings. These require rigorous administrative organizational governance on behalf of Canadian flight schools, who must comply with regulations that focus more on manoeuvre training in small aircraft rather than on air carrier pilot training—which in Canada is the responsibility of the carriers themselves.

Canadian certification standards that would have permitted organizations (other than air operators) to provide training towards transport-category aeroplane type ratings simply did not exist. In effect, the MPL had nowhere to go. The existing Canadian Aviation Regulations (CARs), in transition to a more performance-based model, are today still prescriptive and require a new approach for the effective implementation and oversight of any competency-based training programme.

Transport Canada recognized that the traditional safety net needed to be adapted to allow Canada's entry into the global air carrier training field and to successfully implement an MPL system. This was the perfect opportunity to create a new, performance-based safety net.

Toward a Performance-based Safety Net

Transport Canada acknowledged that the creation of this new playing field would require a multi-disciplinary approach: one that would bring together expertise in training, licensing and organizational certification. This approach would promote new thinking and the ability to work outside of the regulatory box while ensuring integrity in the governance and planning of regulatory development.

A team of subject matter experts was assembled to create, from a clean slate, a suitable regulatory framework that would allow the Canadian MPL to reach its full potential. Their directives were clear:

- Recognize that Transport Canada's responsibility lies in developing and enforcing codes of conduct for safety. The responsibility for flight training programme development belongs to industry.
- Develop a set of performance-based regulations that is resilient to change, enduring and flexible enough to accommodate new and existing technology and training methodologies.
- Create a framework for Approved Training Organizations (ATOs) that promotes quality and innovation in flight training.
- Ensure transparency through expanded industry consultation and do not work in isolation.
- Focus on the future, on competency-based training, on MPL.

Achieving Competency

The new framework under consideration needed to be built from the bottom up. It required firm anchors to support it into the future. The implementation team began to look at other industries that had already successfully trained competent individuals to competency standards in their fields.

Competency-based flight training is a global methodology. It is already successfully used by many air forces and designed to achieve desired outcomes; namely to train competent air force pilots for their deployment on specific aircraft, tasks and missions. It focuses on achieving quality objectives and not on quantitative inputs.

In a competency-based approach for an MPL, performance benchmarks are developed against a detailed job task analysis, partially specific to each air carrier. Continuous assessment of the trainees against these established baselines moves them in a direct line towards the end goal: the right seat job. It bypasses other, traditional skill assessments such as those of a private pilot or a commercial pilot in single-crew operations. These can be gained through a bridge programme to another licence.

The team discovered this systems-focused approach in civilian organizations in other fields, such as manufacturing, healthcare and even law enforcement. In these organizations the interest lies: on the desired outcome of a specific product or event; on continuous improvement of the process to create a positive outcome; and on meeting the requirements of the specific customer or expectations of the public. These are organizations governed by Quality Systems.

This realization led to the cornerstones of Transport Canada's performance-based safety net, which includes the following elements:

Organizational strength

The governance and certification of a training organization based on quality principles ensures the training provider's obligation to strive towards training excellence.

Instructional System Design (ISD)

A detailed job task analysis of a co-pilot, for a specific air carrier applied to a training programme, promotes a successful outcome for both the trainee and the air carrier. Learning management systems are invaluable assessment and tracking tools in rigorously executing continuously validated ISD-based programmes.

Proof-of-Concept

Any new programme or any new ATO must be proven under closely-monitored conditions prior to being accepted with final authority. This gives all stakeholders the opportunity to recognize errors and oversights, to discover opportunities for improvement and to refine a desired outcome.

Validation

Traditional test methods for knowledge and skill, such as written examinations and flight tests, on their own provide only a momentary snapshot of a trainee's ability

Their performance on the MPL flight test exceeded all expectations. These 12 young men then proceeded to their airborne base training on the aircraft and are expected to enter service with Air Asia as competent first officers with bright futures.

to perform the test. Continuous assessment against the performance benchmarks allows an ATO to fine-tune the individual requirements of the student on an on-going basis, with the outcome—performing on the job—and not the final test, clearly at the forefront. Transport Canada recognized early on the need to develop mastery exams and flight tests tailored to the needs of the MPL holder. Finally, job performance reports provide the ultimate validation of the success or failure of a training programme. They are, for the continuous improvement of a training programme, perhaps the most valuable validation tool.

Quality Certification

Whereas traditional oversight systems measure success solely by the performance of the trainee, Transport Canada is introducing effective methods of measuring the performance of the ATO.

While the development of a competency-based training programme is most certainly the domain of our stakeholders, the certification of training organizations is the sole respon-sibility of the regulator. Knowing that a holistic systems-approach to training would provide the best chance for success, Transport Canada applied the same principles to the certification of ATO applicants.

Borrowing from quality principles that are established in many global industries, the overarching regulatory obligation introduced to our training providers was: *Establish and maintain an effective quality system.* This requires an organization to clearly set its own goals and limits, to document all processes applied to the provision of flight training and to abide by these processes and continuously assess and improve upon them.

This represents an effective quality management environment where competency, success and (most importantly for a regulator) safety can thrive.

This shift not only represents a change in how organizations can do business, but in how Transport Canada needed to approach the certification process. Traditionally, regulators certify flight training organizations where minimum requirements for documentation, personnel, aircraft, facilities and safety have been and continue to be met.

Transport Canada has a clear mandate to provide safety oversight. With the tools available, Transport Canada monitors examination and flight test records of the flight training units and individual instructors. By-and-large, however, if an organization is safe there exists very little regulatory pressure to engage in quality training.

This incentive is exerted mainly by competitive business forces. Yet it is undisputed that the quality of the training of a pilot has a direct impact on the safety of our transportation system.

The initial, provisional certification of an ATO is accomplished through a compliance validation inspection, whereby Transport Canada gains assurance that the ATO is well-enough equipped to proceed with executing the authorized training programmes. Only after the training provider's operational and administrative processes have been deployed, measured, scrutinized and improved, can the regulator assess the effectiveness of the quality system. A successful final quality assessment and certification of the ATO is the result of ongoing monitoring over a period of up to 12 months.

This regulatory obligation is not insignificant. Quality systems require investments, attention and continuous nurturing. Some sceptics even question the impact on their business.

And so what is in it for the training provider? Companies that manage their business with quality systems have long recognized that the benefits largely outweigh the costs. Quality provides efficiency. Quality provides safety. Quality provides continuous improvement of products and lasting satisfaction of the customer.

In accordance with the proposed MPL and ATO regulations, as well as Annex 1 to the Convention on International Civil Aviation, Transport Canada will afford to ATOs, upon meeting certain conditions, the ability to provide flight training under an 'alternative means of compliance' with existing regulations. In the case where an original intent of a regulation can be met with no degradation to safety, training to other than the existing prescriptive requirements could be authorized. This autho-rization would only be accessible to those organizations who have met the requirements of an ATO and have attained that level of certification.

These are high stakes and high risks. The benefits and the rewards are yet to be proven.

The Canadian Approach

The proposed regulatory framework was unanimously accepted by the Canadian Aviation Regulation Advisory Council (CARAC), a joint undertaking of government and the aviation community. It is now in the final stages of legal drafting and is expected to be pre-published in Part I of the *Canada Gazette* for comments and eventual incorporation into the *Canadian Aviation Regulations,* subject to Parliamentary approval.

The successful implementation of the MPL programme required the development of additional guidance and validation tools. ATO applicants are guided through the new set of regulations with manuals and forms on ATO certifi-cation and MPL training programmes. New mastery exams and flight tests were developed to include job-focused phase of flight components. The testing benchmarks were derived from established testing criteria and methodologies, along with current job task analysis data and latest occurrence reports. They relied on industry consul-tation with various pilot organizations.

Industry stakeholders and the public need assurance that the implementation of the proposed ATO and MPL regulations and their future oversight will continue in the best interest of Canadians. In keeping with ICAO recommendations, Transport Canada convened and chaired the first meeting of the MPL Advisory Board of Canada in June 2010, in order to remain engaged with interested stakeholders in the on-going development of the Canadian MPL regulatory environment and to implement best practices.

Under a Memorandum of Understanding with CAE Inc, a global training provider, Transport Canada agreed to provide the regulatory oversight to CAE's inaugural MPL training programme, which commenced in February 2010 in accordance with the proposed regulations.Provisional ATO certification was granted to Moncton Flight College, a member of CAE's Global Academy and two of CAE's own training centres in Dallas and Toronto. Jointly, these three ATOs were to embark on an MPL training programme beta-test, training 12 Malaysian cadets to become first officers on the Airbus A320 for Air Asia, one of the largest operators of this aircraft type in the world.

This required close coordination between Transport Canada and the Department of Civil Aviation in Malaysia that is responsible for the safety oversight of Air Asia. The relationship between these two regulators has been instrumental in the progress of this MPL beta-test.

Following a thorough screening process, an early focus on both English language and aviation English language training was crucial to the trainee's progress. The quality systems of the three ATOs closely scrutinized the curriculum as it unfolded, documenting improvements for future offerings of the programme. The continuous close assessment for required competencies resulted in all trainees meeting all benchmarks very closely together. In fact, all Air Asia cadets achieved, on schedule, their final graduation in May 2011. Their performance on the MPL flight test exceeded all expectations. These 12 young men then proceeded to their airborne base training on the aircraft and are expected to enter service with Air Asia as competent first officers with bright futures.

Their future performance will be closely monitored. It will have an impact on many aspects of MPL in the future, including screening methods, training programme development and ATO oversight.

The ATOs, through the strengths of their respective quality systems, have already realized improvements to the training syllabus and their daily operations.

Transport Canada is encouraged by the positive results of its first MPL beta-test and the competencies it has gained itself during this process. This creates opportunity to expand the inspector competencies needed to effectively authorize and oversee competency-based flight training.

As the MPL settles-in and becomes part of the Canadian aviation training landscape, Transport Canada and its ATOs can look forward to a future of quality and continuous improvement in flight training. Transport Canada is looking forward to sharing more of its experience on MPL, competency-based training and the implementation of the associated regulatory framework with Member States and at the 2013 ICAO-MPL Conference in Montreal. ■

Total Training & Resourcing Solutions

Oxford Aviation Academy and Parc Aviation specialise in the provision of integrated training and resourcing solutions to the global aviation industry. This partnership provides our customers with a unique opportunity to draw upon tailored solutions from a training provider with over 150 years of combined experience in training excellence and resourcing expertise that is second to none. With facilities located throughout Europe, North America, Australia and Asia-Pacific, we have the resources and the experience to match your operational requirements leaving you free to concentrate on the success of your core business.

Oxford aviation academy

www.oaa.com

Parc aviation

Securing the Future Global Pilot Pipeline

As an industry, we're faced with an enormous and complex issue at a time of challenging economic and political realities, changing demographics, and rapidly evolving technologies. The issue is this: How are we going to meet the exponentially growing demand for well trained, qualified aviation personnel over the coming decades?

As Roei Ganzarski, Chief Customer Officer at Boeing Flight Services writes, the reality is that the traditional infrastructure and 'pipeline' that once supported careers in aviation is diminishing, and our ability to recruit, educate, train and retain current and future aviators is not nearly sufficient to meet the foreseeable demands of the industry.

Roei Ganzarski is Boeing's Chief Customer Officer for Training & Flight Services and is responsible for leading all market and customer-facing activities. Reporting to Roei are the global sales, business development, marketing, communications, strategy, customer service, and sales operations teams. In addition, Ganzarski leads the unit's business strategy and customer engagement culture transformation. Ganzarski's previous positions at Training & Flight Services have included Vice President Sales, Director of Marketing, Director of New Ventures, and Director of Sales and Business Development for Asia-Pacific. Prior to joining Training & Flight Services in 1999, Ganzarski held financial analyst positions in corporate finance and investment banking, and leadership positions in advertising. Ganzarski also served in the military as an officer in both combat and training units.

Based on the 2010 *Boeing Current Market Outlook,* more than 30,000 new commercial airplanes will be delivered to airlines in the next 20 years.

To fly and maintain those airplanes, Boeing Flight Services estimates that nearly half a million new pilots and about 600,000 technicians will be required between now and 2029. The fast-growing Asia-Pacific region alone will need 180,000 pilots.

Clearly it is critical that we in the industry provide the tools, technology, training and encouragement that the next generation of commercial pilots and mechanics need in order to be motivated to establish a career in aviation.

In December 2010, *US News and World Report* ran a story citing "commercial airline pilot" as one of the 50 best careers for the next decade. But based on data from the US Bureau of Labor Statistics, apparently a career as a commercial pilot is no longer as attractive as it once was, resulting in a steady decrease of new pilot certificates being issued in the U.S.

There's a disconnect there somewhere.

The aviation industry faces strong competition from other industries for skills-based employees. What was once the allure of flying is now lagging behind other professions.

We believe the answer is not a one-size-fits-all solution, but a combination of traditional and new training methods to meet the differing needs of airlines around the world.

The newest methodology, and one which Boeing proved successful in its beta test in Australia, is MPL (Multi-crew Pilot License). MPL provides graduates with an ICAO-sanctioned license and is focused on the performance of the trainees and whether they achieve specific and job-related first officer competencies, rather than being focused simply on the hours that a trainee has flown.

An MPL programme can have many advantages, including:

1. Maximizing learning efficiency by using integrated mission ready tools.
2. Preparing pilots to be ready to serve as first officers for the target airline from early on in their training.
3. Minimizing teach-to-test regulatory requirements.
4. Eliminating unnecessary training events and testing, which reduces the probability that pilots will improperly apply procedures learned in one aircraft to the aircraft they will be licensed to fly.
5. Emphasizing not only the production of pilots who are technically proficient, but who also possess the professional skills that airlines desire in their pilots.

MPL provides graduates with an ICAO sanctioned license and is focused on the performance of the trainees and whether they achieve specific and job-related first officer competencies, rather than being focused simply on the hours that a trainee has flown.

6. Focusing on Crew Resource Management and Threat and Error Management from the beginning of training, which typically results in a much higher level of competency in dealing with events for which a pilot may not have been trained.

Boeing has invested significant time and resources into MPL. We believe MPL is the way that many pilots around the world will be trained in the future. While it may not be the preferred standard for pilot training in the United States, it will be the preferred standard for many pilots flying *into* the United States.

Developed specifically to deliver qualified first officers to the jet transport airline industry, the Boeing academy solution was created to address the aviation industry's increasing demand for pilots by expanding the global pilot pool.

Many regulatory authorities around the world have already approved MPL programmes, and hundreds of pilots have graduated with this new license.

Boeing is working with accredited flight schools globally to introduce MPL into a number of different markets. We want to ensure the continual flow of high-quality, line-ready first officers, through highly effective training programmes.

Boeing has also designed a First Officer Academy solution that is a seamless programme formed through partnerships between Boeing Flight Services and individual ab initio training providers. Developed specifically to deliver qualified first officers to the jet transport airline industry, the Boeing academy solution was created to address the aviation industry's increasing demand for pilots by expanding the global pilot pool.

For those pilots who have a low number of flying hours and/or no prior jet aircraft experience, Boeing offers a First Officer Jet Bridge course. The 15-day course includes 11 days of ground training, Crew Resource Management, Threat and Error Management, Jet Indoctrination and human factors training, as well as four days of full-flight simulator sessions. The repetition and maneuvers in the full-flight simulator helps build confidence and time for the student pilot.

By providing students with the additional training needed to bridge the gap from flight school experience to flying in a multi-crew transport category jet environment, the First Officer Jet Bridge solution optimizes a student's time spent in the type rating course and better prepares them to fly as a crew member.

The challenge of recruiting, educating, training and retaining qualified professionals is an industry-wide issue that, if left unresolved, could prove our collective undoing. The challenge only gets greater as a new generation of potential aviation personnel enters the work force. These new pilots and technicians will be significantly more tech-savvy than their present-day peers and, because of the technology that has helped shape their lives, their learning and communications expectations will be different.

Across the air transport sector, training organizations, manufacturers, airlines, aviation authorities and others have to adapt their teaching methods to new cultural and generational learning styles. We have to do it now if we are to restore the prestige that has been associated with working in aviation.

But it is more than adapting to learning styles. We need an industry-wide initiative that reaches into high schools and universities to generate excitement about careers in aviation. This could involve industry-developed curriculum to be delivered in-country, by airlines in cooperation with educational institutions. It could be a series of lectures developed by ICAO and delivered to high schools and colleges by airlines around the world. It could be both, along with any number of other concepts, but unless we view this as imperative and not just an initiative, we will not succeed, individually or collectively.

We applaud ICAO and its Next Generation of Aviation Professionals (NGAP) initiatives and we're committed to working with ICAO and other industry stakeholders to continue to deliver on our promise of safe and efficient air travel.

Together we can also deliver an engaged and highly-qualified aviation workforce of tomorrow. ■

CRM Assessment

A Pilot's Perspective

The International Federation of Air Line Pilots' Associations (IFALPA) has long recognized that relying solely on a pilot's technical knowledge and skills is not sufficient to safely operate complex aircraft in today's flying environment. Crew Resource Management (CRM) was developed over 30 years ago to help address this issue.

As Captain David McKenney of the International Federation of Air Line Pilots' Associations highlights, IFALPA supports CRM as a training programme and as an adjunct to traditional technical training approaches. The pilot's federation also suggests that industry and regulators should focus their efforts on producing guidance that encourages more effective CRM training approaches and on developing tools to measure CRM results across the entire culture within the airline.

Captain David McKenney is a B-767 pilot for United Air Lines and is the Vice Chairman (Human Factors) for the IFALPA Human Performance Committee. He also serves as a human factors and training expert for the Air Line Pilots Association, International (ALPA). Prior to his airline career, Captain McKenney was a Computer Science Professor at the U.S. Air Force Academy. He also served as Co-chair of the 2010 FAA-Industry Stall/Stick Pusher Working Group and is Co-chair of the United States PARC/CAST Flight Deck Automation Working Group. Captain McKenney has accumulated over 16,000 hours in 35 years of military and civilian flying and has additionally served as a flight instructor and check airman.

Originally portrayed primarily as a conflict resolution skill, Crew Resource Management (CRM) has evolved today to define a set of skills that supports pilot technical and decision-making flying capabilities. It does this by providing them with the cognitive and interpersonal skills needed to address human error by managing resources within an organized operational system.

CRM is normally defined as a management system which makes optimum use of all available resources, including equipment, procedures and people, to promote safety and enhance the efficiency of flight operations. IFALPA believes CRM can improve the proficiency and competency of individual pilots and flight crews as a whole, especially when it is implemented as an error management strategy.

Flight crews need specific skills and strategies to assist them in coping with the dynamic demands of piloting and in reducing errors. IFALPA supports integrating CRM into flight crewmember training as a tool to minimize the consequences of human error and to improve flight crew performance.

Industry recognizes CRM as a 'best practice' when fully integrated into initial licensing and recurrent training programmes, including Multi-Crew Pilot Licensing (MPL) and Advanced Qualification Programmes (i.e., AQP, ATQP).

When first introduced, a cornerstone in the acceptance for CRM training was the assurance that it would not include evaluation. Much of the value and strength of CRM is based on this principle. IFALPA believes the introduction of any checking or jeopardy assessment process has the potential to destroy such benefits and negatively affect safety. To understand the issues, one needs to review what CRM training is and how it is implemented.

Threat and Error Management

Fifth generation CRM places a good deal of emphasis on behavioral trends and Threat and Error Management (TEM). One of the underlying principles of this fifth generation approach to CRM is the premise that human error is inevitable and should be normalized within the system (Helmreich, 1997).

Pilots should be taught the limitations of human performance and be trained to develop skills to detect and manage error. For this error management approach to succeed in any organization, the organization itself must first recognize and communicate their formal understanding that errors will occur and also adopt and strongly reinforce a non-punitive approach to error reporting.

Flight crews need specific skills and strategies to assist them in coping with the dynamic demands of piloting and in reducing errors. IFALPA supports integrating CRM into flight crewmember training as a tool to minimize the consequences of human error and to improve flight crew performance.

CRM as a Culture

CRM is not just aircrew-centric; it does not start and stop with the captain or crew. Effective CRM must be embedded within the cockpit and safety culture of the airline while addressing airline-specific items (i.e., carrier-specific operations and procedures) and needs to be practiced and accepted at all levels of the organization to positively affect operational safety.

To be truly effective, CRM must be embedded in the airline's Safety Management System (SMS), which should provide for open advocacy and feedback. Each carrier must therefore develop a CRM programme that is tailored to their specific culture and pilot demographics and understand that no single CRM programme or approach is suitable for all operations and all airlines.

This lack of 'one-size-fits-all' characteristic has made it difficult for the industry to adopt a single and universal CRM programme with standardized terms, definitions and application methodology.

Integrating CRM into Flight Crewmember Training

Recognizing that safety depends on the coordination of key people in the entire system and not just on the actions of pilots, CRM training should be implemented by carrier flight operations personnel who possess pertinent knowledge of the culture, policies, procedures and training of that particular air carrier. Evidence shows that a joint CRM course for flight crews, cabin crews, and dispatchers can improve the level of understanding and cooperation across the entire team.

Air carriers develop CRM programmes that promote the integration of practical flight management skills with traditional technical skills. CRM awareness and error management training is most beneficial when the training curriculum is individualized for each pilot, tailored to each airline's unique culture and includes the added realism of Line Oriented Flight Training (LOFT).

Lack of Regulatory Guidance

While CRM has evolved over the past 30 years, regulatory measures have not kept up. A lack of standardized CRM terms, definitions, application methodologies and guidance is continuing to impede CRM standardization across the industry.

Different CRM application methodologies relating to awareness training and error management strategies are currently used. For many years, the industry provided guidance material that centered on the benefits of flight crewmembers' awareness of CRM, often referred to as 'soft skills'. The biggest benefits to teaching soft skills were the resulting improvements in attitudes, perceptions and teamwork. Although training in the soft skills is useful to pilots as recognition and perception training, it only represents one of the issues confronting flight crews.

The error management methodology uses standardized procedures, flight management skills and specific error prevention techniques for the management of safe flight by flight crewmembers. Currently, there is no governing regulatory documentation for error-management techniques, although IFALPA strongly supports training in this area. As a result, CRM courses among airlines vary widely, some only teaching awareness training while others stress both awareness training and threat and error management.

Subjective Evaluation Criteria

IFALPA stands firmly against any CRM evaluations for flight crewmembers, individually or as a crew in any jeopardy event and most especially when the evaluations in question utilize only subjective criteria.

Little, if any, qualitative evaluation criteria exist for CRM and there is no universally accepted methodology for identifying unsatisfactory pilot CRM performance. Regulators have allowed operators with different corporate cultures a great deal of flexibility in introducing CRM training, resulting in a wide spectrum of quality, quantity and effectiveness levels in CRM courses across the industry.

Vague terms such as 'Captaincy,' 'Airmanship,' 'Followership,' and 'Synergy' lack any formal or recognized definition within the CRM concept. These worthwhile attributes are presently beyond the ability of any expert to evaluate objectively, much less a check airman unskilled in the meaning of these terms.

Specifically, evaluation of the effectiveness of non-technical training skills is very subjective and extremely variable.

There is no universally accepted definition of the CRM concept or category of CRM terms within the air carrier industry. IFALPA is concerned because flight crew CRM evaluators lack adequate standards and guidance material.

CRM evaluation exposes a crewmember's certificate and career to unsubstantiated jeopardy when no objective industry definitions or standards of CRM skills exist. In one case, an air carrier terminated pilots based on CRM performance alone, although CRM has not matured sufficiently enough for evaluators to effectively evaluate a flight crewmember's performance.

Industry experience has shown that it is difficult to train and calibrate instructors/evaluators to successfully identify markers that would lead to an overall 'grade' or 'consistent grading.' This is in part due to these markers not being adequately defined and therefore not observable.

Unintended Consequences Of Evaluating CRM

There has been no demonstrated case that improved safety results from introducing jeopardy assessment/checking of CRM. In fact some CRM experts within the aviation industry believe the unintended consequences of evaluating CRM could actually reduce current safety margins. IFALPA agrees in its published IFALPA Policy on CRM, which states in IFALPA Annex 6, Part I that:

> "IFALPA believes that to introduce jeopardy assessment or checking of CRM at this point would fundamentally change the facilitator / instructor and flight crew relationship and potentially block or reverse the many benefits to be gained from CRM training, including the possibility of having a negative impact on safety. Jeopardy assessment or checking CRM may result in crews producing acceptable CRM behaviour in the simulator but have little real impact on the safety culture of the airline."

For CRM training to genuinely impact the safety culture in aviation, CRM must be wholeheartedly embraced by pilots without the threat of any punitive action. To this end, IFALPA supports open feedback and discussion between facilitators/instructors and flight crew on CRM topics. This feedback should however be non-numerical (e.g., Enhanced – Standard – Detracted) and focus on reinforcing good skills and discussing areas of improvement. IFALPA recognizes that a high level of trust and openess must be present for such discussions to be effective.

Besides IFALPA, individual pilots are also concerned about the negative implications of 'evaluating' CRM skills. Evaluations can lead to a mistrust of the programme, especially if the evaluation of these skills is done in an arbitrary and capricious manner. If we evaluated CRM today, it would be done in an 'opinion-oriented' fashion. This could lead to evaluation

Just because crews can demonstrate effective crew coordination while being assessed under jeopardy conditions does not guarantee they will actually practice these concepts during normal line operations. Industry studies show that line audits, where crews are observed under non-jeopardy conditions, provide more useful data.

controversies and mistrust of the system by the pilots, resulting in possible negative safety implications.

Another undesirable result of attempting to evaluate CRM would be the unwillingness of pilots to be themselves during evaluation and training. What is much more likely is that they would act the way they perceive the check airman wants them to act in order to achieve a passing grade. This would result in a misrepresentation of the crew's CRM skills and most likely some undiscovered deficiencies in a crew's performance, primarily because the evaluator wouldn't have established a realistic represen-tation of how the crew conducts CRM during normal line operations and thus could not have provided meaningful feedback.

Introducing jeopardy assessment after 30 years of effective CRM training completely undermines the fundamental principles of fifth generation CRM. The success of an effective fifth generation CRM programme that focuses on threat and error management requires the formal understanding that errors will occur and that companies must adopt a non-punitive approach to error. Introducing assessment/checking of CRM skills would introduce the possibility of failure which could be perceived by many pilots as punitive.

Since effective CRM must be embedded within the safety culture of the airline, and since it similarly needs to be practiced and accepted at all levels of the organization to positively affect operational safety, it is difficult to independently assess/check only one single element (in this case the pilots) on their company culture skills when these are actually dependent on multiple personnel performing multiple tasks across the entire company.

To evaluate only one aspect of a company's CRM system would do little to increase the safety of the entire system. Further complicating the issue is that evaluation would be based mostly on subjective evaluation criteria that have already proven very difficult to use as a basis for training and calibrating instructors/evaluators.

Just because crews can demonstrate effective crew coordination while being assessed under jeopardy conditions does not guarantee they will actually practice these concepts during normal line operations. Industry studies show that line audits, where crews are observed under non-jeopardy conditions, provide more useful data (Helmreich, Merritt, & Wilhelm, (1999)). Data from such audits demonstrates that changes in pilot behavior result from CRM training that includes LOFT and recurrent training (Helmreich & Foushee, 1993), which is consistent with participant feedback.

Summary

IFALPA supports CRM as a training programme and as an adjunct to traditional technical training programmes. IFALPA recognises the substantial benefits arising from training of non-technical skills and supports the continued instruction and reinforcement of CRM on a regular basis. CRM can improve the proficiency and competency of individual pilots and flight crews as a whole, especially when it is implemented as an error management strategy and is not checked/assessed by any method that could result in a failure.

Instead of jeopardizing the safety record of an already successful CRM programme by introducing CRM skill checks that have no demonstrated safety benefits, industry and regulators should instead focus their efforts on producing comprehensive guidance on how to properly train CRM and measure its effectiveness across the entire culture within an airline. This would include developing training guidance on: how to effectively teach error management skills; specific error prevention techniques; integrating CRM training into scenario-based training; integrating flight management skills with technical skills; helping pilots develop decision-making skills; and lastly training pilots on how to properly manage resources in today's complex aircraft/airspace system.

Pilot CRM skills have been used in many high-profile 'saves', such as the UAL 232 complete hydraulic failure in 1989, or more recently the US Air 1549 landing in the Hudson River. More important to overall industry safety is the fact that nearly a half million pilots successfully use their CRM skills day-in and day-out, safely completing nearly 100,000 daily flights without ever having had jeopardy assessment of their CRM skills. ■

ICAO Training Report Directory Listings

Africa

CAE GLOBAL ACADEMY DOUALA (CAMEROON)

One Step Ahead

Contact: Mr Joseph Barla Ekwe, General Manager
Email: info@sfa-a.com
Tel: +237 76 15 95 71
URL: www.caeglobalacademy.com/cae_global_academy_douala.shtml

CAE Global Academy Douala is one of 11 CAE Global Academy schools around the world. With a newly developed infrastructure and applying the experience of the world's leading aviation training organization, CAE Global Academy Douala is focused on being the leading high-quality flight academy on the African continent. CAE Global Academy Douala offers ab initio pilot training, advanced training, flight dispatcher training and flight attendant training - all oriented toward professional airline careers.

EGYPTIAN AVIATION ACADEMY (EGYPT)

Fly to the Sky Train in EAA Egypt

Contact: Dr Abdelkarim Abdelaty Elsayed, Dean of CAMTC / EAA
Email: camtc-dean@eaaegypt.com
Tel: + 202 33505 449
URL: www.eaaegypt.com

EAA is a leading academy in Middle East and Africa. It contains three main colleges; Misr Flying College MFC (for all pilot training Courses), Air Traffic Control College ATCC (ATS and Air Transport Courses) and Aviation Management College CAMTC (aviation medicine, airport management, engineering and operations, aviation security and dangerous goods, aviation engineering, HRM, etc). EAA focuses on the ICAO regulations. Standard Training Program, Qualified Instructor and modern facilities and aircraft. EAA colleges MFC and ATCC are recognized by ICAO as Regional Training Centers RTC, while CAMTC college is recognized by ICAO as a Centre of Excellence COE for its aviation medicine courses. EAA welcomes trainees from Africa and Middle East.

INFOHAS GROUPE (MOROCCO)

Above & Beyond

Contact: Mr. Rachid El Sabah, International Relations Manager
Email: infohas@menara.ma
Tel: +212 537 661763 (Morocco) +1 514 418 6368 (Canada) **Fax:** +212 537 762025 (Morocco)
URL: www.infohas.com

INFOHAS is a Company based on the founders' long experience within cabin services and ground operations. It has been established in 1996 to be one of the best leading institutes in Morocco focusing on cabin crew and ground agents training and recruitment. INFOHAS is officially licensed and qualified as Cabin crew training experts by the Moroccan Ministry of labor and Professional training. Our mission: Is to enhance aviation and tourism training internationally.

UNITED ATS (EGYPT)

United ATS are committed to Aviation Excellence

Contact: Mr. Tarek Ibrahim Hussein, Training Director
Email: training@unitedats.com
Tel: +20144561117 **Fax:** +20106090684
URL: www.unitedats.com

United ATS plays an integral part in aviation safety by providing competent and professional services/training which complies with international standards. Services/training is provided with integrity that is customer focused and placing value on safety to the aviation industry. We provide solutions to stakeholders to meet mandatory ICAO requirements, such services are Instrument Procedures Design, Airspace management and design, Aeronautical Studies, Aeronautical Survey, Turn Key eTOD services and all related professional training to our provided services.

Asia

THE GULF CENTER FOR AVIATION STUDIES (UNITED ARAB EMIRATES)

The Regions dedicated airport and aviation training hub

Contact: Mr. Tarek Khoury, Training Manager
Email: training@gcas.ae
Tel: +97124942355 **Fax:** +97124942366
URL: www.gcas.ae

The Gulf Centre for Aviation Studies (GCAS) is a member of the International Civil Aviation Organization (ICAO) as the world's first 'TRAINAIR PLUS' training centre, and is qualified as an aviation security training facility by the General Civil Aviation Authority (GCAA). It is also the exclusive training provider for the Joint Aviation Authorities of Europe Training Organisation (JAATO) in the Gulf and Middle East regions, and one of the Airport Council International's (ACI) training hubs. GCAS has partnered with The International Air Transport Association (IATA), and Safe Passage International (SPI). Through our partners and GCAS' own proprietary training portfolio, your training needs will be completely addressed.

IRANAIR *ENGINEERING & MAINTENANCE TRAINING DEPARTMENT* (IRAN, Islamic republic of)

Developing well-qualified aircraft maintenance professionals is our pride

Contact: Mr. Mehdi Ghoncheh, Director General
Email: techtraining@iranair.com
Tel: + 98 21 46627700

IranAir *Engineering & Maintenance Training Department* (EMTD) has played a pioneering role in the aviation maintenance training for technical staff in Iran since 1970. In full compliance with CAO.IRI and International Regulations, EMTD offers a wide range of technical courses including knowledge and practical training facilitated by well-equipped standard classrooms, mechanical workshops and avionic laboratories. EMTD welcomes more than 150 trainees at the same time and provides them with easy access to the hangars and workshops.

SINGAPORE AVIATION ACADEMY (SINGAPORE)

Developing Talent for Global Aviation

Contact: Ms Zheng Wanting, Executive (Marketing & Promotions)
Email: saa@caas.gov.sg
Tel: 65 65406209/6543 0433
URL: www.saa.com.sg

The Singapore Aviation Academy (SAA) - the training arm of the Civil Aviation Authority of Singapore (CAAS), offers a wide range of operational and management programmes under its four specialised schools - School of Aviation Management, School of Aviation Safety and Security, School of Air Traffic Services and School of Airport Emergency Services. Besides developing talent for the aviation community, it also serves as an international platform for the sharing of knowledge and experiences through its conferences and forums.

Europe

AEROLINGUA TRAINING CENTRE FOR FURTHER PROFESSIONAL EDUCATION (UKRAINE)

English is your runway!

Contact: Ms. Olena Petrashchuk, Doctor of Science, Professor
Email: info@aerolingua.com
Tel: +38 067 467 37 06 **Fax:** +38 044 457 78 68
URL: www.aerolingua.com

AEROLINGUA Training Centre for Further Professional Education has a full accreditation from CAA of Ukraine to provide English Language training and testing services for aviation personnel. AEROLINGUA offers courses in Aviation/Technical English as well as English Language assessment against ICAO scale (for pilots and controllers) and Council of Europe Framework of Reference (for aviation engineers and technicians). AEROLINGUA is headed by Dr.,Prof. Olena Petrashchuk – an author of Aviation English Test, Aviation English for controllers, training course for examiners/raters.

AIR SAFETY SECURITY SERVICES – A3S (SWITZERLAND)

Experience and Professionalism according to your needs and expectations

Contact: Lt Col François VILLARD, Managing Director
Email: a3s@air-safety-security.com
Tel: +4179 635 77 63
URL: www.air-safety-security.com

Training and consultancy for airports, airlines, national civil aviation in fire and rescue, safety, security and crisis management issues. Security threat analysis for airports and airlines. Family care centers design, building and training. Emergency plans and major exercises. Basically we are working on site in order to give the most accurate and precise answer to your needs.

AVIOTRACE SWISS (SWITZERLAND)

The future is in the air

Contact: Eng. Franco Matarazzo, Sales Manager
Email: franco.m@aviotraceswiss.com
Tel: +41 445860484
URL: www.aviotraceswiss.com

Aviotrace Swiss is an approved Part.147 Maintenance Training Organization particularly focused on Part 66 Basic Training, for the achievement of Aircraft Maintenance License (categories A1, B1.1, B2), Maintenance Training and Continuation Training. Aviotrace Swiss offers a wide range of other courses and services, tailored to the needs of individuals as well as aviation companies. Aviotrace Swiss courses offer the theoretical part in different solutions: Classroom, Multimedia Based Training system (Distance Learning) and Virtual Classroom (Web-based instruction and Tutors).

Europe

AXIS FLIGHT TRAINING SYSTEMS (AUSTRIA)

Your new partner for professional simulation

Contact: Mr. Hannes Pieringer, Marketing & sales
Email: office@axis-simulations.at
Tel: +43 0 5 9889 102
URL: www.axis-simulations.aero

AXIS manufactures flight training devices that provide pilots with a genuine training experience and what is more they do so with unmatched operational efficiency. Our FFS is designed to improve aviation safety, meet todays training requirements and exceed the regulatory standards. With all our products we ensure maximum usability with minimum downtime.

BELGIAN FLIGHT SCHOOL (BELGIUM)

The Best Way to Touch the Sky!

Contact: Mr. Maxime Wauters, Business Development Manager
Email: m.wauters@bfgroup.aero or info@bfschool.aero
Tel: +32 71 34 55 10
URL: www.bfschool.aero / www.bfgroup.aero

Belgian Flight School is Belgium's leading Flight Training Organization for airline pilots. The organization is approved by the Belgian Civil Aviation Authorities (BCAA), on behalf of the Joint Aviation Authorities (JAA), to train airline pilots according to current European regulations (EASA/JAR-FCL). BFS offers an innovative Integrated ATPL program, offered in joint venture with Aerosim Flight Academy (USA) and provide state of the art, competency based training program. The school also offers a modular program. Since 2008, BFS became a member of BFG (Belgian Flight Group) headquartered at the airport of Charleroi Brussels-South, which offers a wide range of services (other than pilot training) related to general and business aviation.

CAA INTERNATIONAL (UNITED KINGDOM)

Committed to supporting aviation safety around the world

Contact: Training Team
Email: training@caainternational.com
Tel: +44 0 1293 768821
URL: www.caainternational.com

CAA International (CAAi) is a wholly owned subsidiary of the UK Civil Aviation Authority. We offer training, technical assistance and examination services to help you with the development of good practice in aviation safety. CAA International's dedicated training department provides a portfolio of training courses covering all aspects of safety regulation for industry and regulatory clients, drawing on the expertise of the UK CAA and external facilitators.

COMPLANG AVIATION TRAINING CENTRE (RUSSIAN FEDERATION)

Learn more at complang and fly safely!

Contact: Mr. Sergey Melnichenko, Deputy Director
Email: info@complang.ru
Tel: +7 495 589 1356
URL: www.complang.ru

Study Aviation English in Russia and receive the highest standard of tuition in a friendly environment. The following are some of the English language courses offered by CompLang: Level 4 and above training; ICAO radiotelephony; ab initio and refresher course for raters and examiners; testing in accordance with the ICAO language proficiency scale (TELLCAP®); English for pilots, controllers, flight attendants, flight engineers and technicians, etc. Training approaches are based on the ICAO Training Policy.

EDGEWATER COLLEGE (IRELAND)

Aviation Education for Success

Contact: Mr. Finian Connolly, CEO
Email: finian@edgewater.ie
Tel: +353 0 41 98 46500
URL: www.edgewater.ie

Edgewater College is a leading provider of aviation English training, online training products, and language services to training organizations, air operators, aviation authorities and individuals worldwide. Edgewater College provides comprehensive services and expertise to all aviation professionals. Edgewater College is an approved Language Assessment Body under he Irish Aviation Authority (IRL/LAB001-10). Edgewater College is a global organisation, with training centres in Ireland, China, UAE, Kazakhstan and Libya. Course can be provided onsite as well as in-house.

EMERY ROBERTS - AVIATION ENGLISH TRAINING (UNITED KINGDOM)

Best practice in aviation English training and testing

Contact: Mr. Andy Roberts, Director of Training
Email: contact@emery-roberts.co.uk
Tel: +44 0 7977439908
URL: www.emery-roberts.co.uk

Emery-Roberts Aviation English Training Limited (ER) is an internationally-recognised leading provider of aviation English language education and assessment services. Now in its 5th year, ER has grown exponentially and has quickly established itself as a ground breaking leader in the field. ER provides a wide range of scheduled and bespoke language training and testing solutions for pilots, air traffic controllers, cabin crew, maintenance engineers and technicians, ground staff and management. Services are delivered at our training centre in the UK, or at the customer's preferred location.

ECOLE NATATIONALE DE L'AVIATION CIVILE – ENAC (FRANCE)

Live your passion and take off to your future

Contact: Ms. Isabelle Rossi, International and Commercial Affairs Assistant
Email: isabelle.rossi@enac.fr
Tel: 33 0 5 62 17 44 38
URL: www.enac.fr

ENAC is a unique aviation university in the world that offers a wide range of ab-initio and refresher courses for the executives and main actors of the civil aviation world, for both private and public sectors in all fields of its well known expertise: ATM, CNS, airports, air transport, AVSEC, human factors and aviation English. ENAC can also set up tailor-made courses to meet specific needs.

GOLD AIR TRAINING CENTER (TURKEY)

Golden Generation of Aviation

Contact: A. Atila ÖZLÜ, CEO and Deputy Chairman of the Board of Directors
Email: info@goldairtraining.com
Tel: +90 212 465 62 92
URL: www.goldairtraining.com

Aviation courses in your country or in Istanbul. While being trained, enjoy the most inspiring city 'ISTANBUL' by Gold Air Training Centre. Courses are conducted in classrooms or by e-learning. We offer free consultancy for your training needs and human resources.

Europe

HELLENIC AVIATION TRAINING ACADEMY (HATA) (GREECE)

Beyond the front row!

Contact: Mr. Theodosios S. Arpatzoglou, Head of Training
Email: hot@hata.edu.gr
Tel: +30 22990 41314
URL: www.hata.edu.gr

The HELLENIC AVIATION TRAINING ACADEMY (HATA), minutes from Athens International Airport, is the organisational centre of comprehensive service and support solutions including EASA/HCAA approved training for maintenance, flight operations and management, product life-cycle extension, aircraft evaluation/acquisition services and technical publications. HATA satisfies the ever-increasing needs of the civil aviation industry in the south eastern Mediterranean and international markets by developing tailored solutions providing optimum value and effect.

OXFORD AVIATION ACADEMY (UNITED KINGDOM)

Skills for Flight

Contact: Mr. Brian Simpson, Group Chief Executive Officer
Email: info@oaa.com
Tel: +44 1293 543541
URL: www.oaa.com

Oxford Aviation Academy is one of the leading international providers of innovative airline pilot, cabin crew and maintenance training solutions. Operating from 10 ab initio and type training centres across Europe, North America, Asia-Pacific and Australia, OAA specialises in providing integrated “Total Training Solutions” tailored to meet the particular needs of any customer worldwide. OAA Group Company, Parc Aviation, adds flight crew resourcing, technical support and ferry flight services to complete the group portfolio.

PEREGRINE ACADEMY (UNITED KINGDOM)

Aviation Training Excellence

Contact: Ms. Eleanor McKenzie, Director ATM Training School
Email: emckenzie@peregrineacademy.com
Tel: +44 845 5049493
URL: www.peregrineacademy.com

Peregrine Academy provides the highest quality training to Aviation Professionals. We provide a flexible training approach offering both standard and bespoke courses that can be delivered in the UK or worldwide. The Academy utilises carefully selected teaching and learning techniques to maximise the learning experience, promoting understanding and knowledge retention. As an Aviation training school, our aim is to contribute to enhancing professional competence in the Aviation Industry. Courses can be supplemented with English language tuition with a particular focus on Online Aviation English. Peregrine Academy operates 3 Schools: ATM (including AIS/AIM) Airports and Flight Operations (including Cabin Crew Training).

REGIONAL AIR SERVICES (ROMANIA)

Go beyond your limits!

Contact: Ms. Sorin Herea Buzatu, Chief ground Instructor
Email: office@regional-air.ro
Tel: + 40 375 390 390
URL: www.pilotshool.ro / www.regional-air.ro

Best training:
- PPL (A), PPL (H), CPL (A) modular, IR (A) modular, ATPL (A) – distance learning, Class Rating SEP (Land), Class Rating MEP (Land), FI (A), CRI (SPA) and IRI(A)
- Partnership with Bristol ground school
- Integrated management system, certified by Bureau VERITAS in 2009, according to ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007

Best price: • PPH A – 6900 EUR • PPL H – 13.000 EUR • ATPL A – 36.500 EUR

SKY HOW (FINLAND)

Mastering the Human Dimension of Air Traffic Management

Contact: Mr. Mark Blanchard, Director of Operations
Email: mark.blanchard@skyhow.com
Tel: +358 407766159
URL: www.skyhow.com

SkyHow is a service company whose mission is to manage, develop and master the human dimension of air traffic management. Its solutions are designed and built for customers who demand continuity, quality and efficiency. These solutions can now be delivered at a local level, with a SkyHow training centre specifically designed for you. We produce air traffic professionals who are ready to make the decisions of today as well as meet the demands of tomorrow.

THALES ATM TRAINING INSTITUTE (FRANCE)

Long-term relationship with our customers to fulfil future training needs

Contact: Mr. Bruno VILAINE, Head of Integrated Logistics Support Department
Email: bruno.vilaine@thalesgroup.com
Tel: +33 0 6 77 80 11 78
URL: www.thalesatm-services.com

Thales is world leader in ATM systems and civil radars, and has a 70% market share in the navigation aids market. Thales offers integrated gate-to-gate solutions, from pre-flight to landing, ensuring airport safety, efficient traffic handling operations, data sharing on aircraft and seamless handover operations between territories. Thales is involved in the key Single European Sky ATM Research (SESAR) program in Europe, in which it is the largest industrial contributor, as well as a key technology partner in the US NextGen program.

North America

AIRPORTS COUNCIL INTERNATIONAL GLOBAL TRAINING (CANADA)

Reach Your Highest Potential

Contact: Mr. Kevin Caron, Assistant Director, Global Training
Email: training@aci.aero
Tel: +1 514 373 1200
URL: www.aci.aero/training

In 1991 airport operators around the world created Airports Council International – the first worldwide association to represent their common interests and foster cooperation with partners throughout the air transport industry. At the same time, ACI provides the platform for pursuing a constructive and cooperative relationship with the airline associations, governments and regulators. On critical industry issues – liberalisation, ownership, capacity planning, regulatory restrictions, and environmental action – ACI defends airports views and strengthens their ability to shape the future of our industry, backing up individual airport actions. ACI offers its members numerous training opportunities, a customer service benchmarking programme, detailed industry statistical analyses and practical publications.

AIRPORT SECURITY TECHNIQUES, COLLEGE GERALD GODIN (CANADA)

The only specialized training and diploma that will professionalize your airport patrol

Contact: Mr. Philippe Chevalier, Manager, Corporate Training Programs
Email: p.chevalier@cgodin.qc.ca
Tel: +1 514 626 8555 Ext. 287
URL: www.cgodin.qc.ca/formation-aux-adultes/surete-aeroportuaire

AÉROPORTS DE MONTRÉAL and COLLÈGE GÉRALD-GODIN joined forces to develop the exclusive and only college-level courses that teach airport security techniques. We are offering the relocation of this exclusive training in your country . We tailor our airport security training to your needs with an in-field implementation. We will be glad to develop training that takes into consideration the unique realities of your operations.

COMUNICATUS (CANADA)

Providing language solutions for the aeronautical community

Contact: Ms. Lucia Marguglio, Managing Director
Email: lucia@comunicatus.com
Tel: +1 514 265 3877
URL: www.comunicatus.com

Comunicatus, located in Canada, specializes in *Aviation English* for pilots, air traffic controllers and aviation personnel involved in international operations that meet the new ICAO Language Proficiency Requirements, and *Translation Services for the Aviation Industry* that will meet all requirements for accuracy, timeliness, and quality. Call us for a free consultation to discuss your aviation communication needs and our customized solutions at our Canadian Center or at your place of business anywhere in the world.

IATA TRAINING AND DEVELOPMENT INSTITUTE (CANADA)

Developing Human Capital for tomorrow's air transport industry

Contact: Ms. Ismail Albaidhani, Head DL, IATA Training & Development Institute
Email: albaidhani@iata.org
Tel: +1 514 8740202 Ext. 3632
URL: www.iata.org/training

Shifting workforce demographics, talent shortages and skills gaps continue to be shared concerns in the industry. ITDI has the solutions. Our innovative tools and renowned expertise will help you effectively manage your Human Capital at every level. Our total training solutions will help you develop, engage and retain the workforce you need for improved sustainability and performance. Optimize your workforce talent to drive better business performance. For your competitive advantage and success.

South America

ACADEMIA DE CAPACITACION EN SEGURIDAD Y SERVICIOS (CHILE)

Nuestra filosofía de servicio combina calidad en la gestión e implementación de programas y entrenamiento tanto presencial como e-learning, conforma a los requerimientos de nuestros clientes

Contact: Ms. Jacqueline Rodríguez Q., Gerente de Operaciones
Email: jacqueline.rodriguez@acass.cl
Tel: +56 2 2332944
URL: www.acass.cl

ACASS Ltda., ha sido creada con el fin de capacitar a quienes requieran de una formación, no tan sólo desde una perspectiva laboral-instrumental, sino que, además, teniendo presente que dicha capacitación debe integrar sólidos principios éticos y sociales que conviertan al trabajador en una persona de alto valor agregado, dentro del ambiente en que se desempeñe y fundamentalmente, en un real aporte al grupo humano en que se encuentra inserto.

PUNTA DEL ESTE FLIGHT SCHOOL (URUGUAY)

Open your wings into the sky of Uruguay

Contact: Mr. Rodrigo Valetta, International representative
Email: r.valetta@puntaflightschool.com
Tel: +46 73 764 7997
URL: www.puntaflightschool.com

Punta del Este Flight School is a flight training center certified by DINACIA (local Civil Aviation Authority) and located in Punta del Este, a well-known summer resort on the Rio de la Plata / Atlantic Ocean coast in Uruguay, South America. We offer all training courses for different air professionals, with a strong emphasis on curricular training, by making sure that the trainee not only goes through the flight training but also all the theory, through planned and coordinated instruction. Featuring several certified instructors with wide experience Punta del Este Flight School guarantees quality education within planned and agreed upon timelines.

CAE Listings

ONE STEP AHEAD

About CAE

CAE is a global leader in modelling, simulation and training for civil aviation and defence. The company employs more than 7,500 people at more than 100 sites and training locations in more than 20 countries. Through CAE's global network of 32 civil aviation, military and helicopter training centres, the company trains more than 80,000 crewmembers yearly. CAE's business is diversified, ranging from the sale of simulation products to providing comprehensive services such as training and aviation services, professional services and in-service support. The company aims to apply its simulation expertise and operational experience to help customers enhance safety, improve efficiency, maintain readiness and solve challenging problems. CAE is now leveraging its simulation capabilities in new markets such as healthcare and mining.

www.cae.com

CAE TRAINING CENTRES

ABERDEEN, SCOTLAND, UK

Erik Kjeldsen
Business Unit Leader
Tel: +47 5 194 1630
Email: erik.kjeldsen@cae.com

AMSTERDAM, THE NETHERLANDS

Arthur Appelo
Training Centre Leader, Head of Training
Tel: +31 0 23 5671 671
Email: amsterdam-centre@cae.com

BENGALARU, INDIA

Arbinder Pal
Marketing Manager
Tel: +91 80 4285 4005
Email: aviationtraining@cae.com

BRUSSELS, BELGIUM

Geert Aerts
Training Centre Leader
Tel: +32 2 752 9444
Email: brussels-centre@cae.com

CAE Listings

ONE STEP AHEAD

BURGESS HILL, UK (LONDON)

Hasnain Mohsin
Training Centre Leader
Tel: +44 0 14 44 247 535
Email: burgesshill-centre@cae.com

CHARLOTTE, USA

Mike Bucking
Training Centre Leader
Tel: +1 905 672 8650
Email: charlotte-centre@cae.com

DALLAS, USA

Walter Slazyk
Training Centre Leader
Tel: +1 972 456 8000
+1 800 527 2463 (U.S., Mexico & Canada)
Email: simufliteinfo@cae.com

DUBAI, UNITED ARAB EMIRATES

Camille Mariamo
Managing Director
Tel: +971 4 286 9119
Email: dubai-centre@cae.com

KUALA LUMPUR, MALAYSIA

Glen Davis
Training Centre Leader
Tel: +60 3 8777 8060/47
Email: aviationtraining@cae.com

MADRID, SPAIN

Ms. Reyes Jardi Toro
Training Centre Leader
Tel: +34 91 748 1160
Email: madrid-centre@cae.com

MIAMI, USA

Mike Bucking
Training Centre Leader
Tel: +1 905 672 8650
Email: miami-centre@cae.com

MONTREAL, CANADA

Bob Nag
Training Centre Leader
Tel: +1 905 672 8650
Email: montreal-centre@cae.com

MORRISTOWN, USA (NEW YORK CITY)

Michel Azar-Hmouda
Training Centre Leader
Tel: +1 973 581 7400
Email: morristown-centre@cae.com

MOSCOW, RUSSIA

Arthur Appelo
Training Centre Leader
Tel: +7 495 578 7942
Email: vshishkin@aeroflot.ru

CAE Listings

ONE STEP AHEAD

PHOENIX, USA

Tom Ferranti
Operation Leader
Tel: +1 905 672 8650
Email: phoenix.centre@cae.com

ROME, ITALY

Ms. Reyes Jardi Toro
Training Centre Leader
Tel: +39 06 6563 8061
Email: aviationtraining@cae.com

SANTIAGO, CHILE

Alessandro Pinho
Business Leader
Tel: +56 2 601 1500
Email: santiago-centre@cae.com

SÃO PAULO, BRAZIL

Alessandro Pinho
Business Leader
Tel: +55 11 2462 3300
Email: saopaulo-centre@cae.com

SINGAPORE

Shawn Goodfellow
Tel: +65 6546 8320
Email: a320cae@singnet.com.sg

STAVANGER, NORWAY

Erik Kjeldsen
Busines Unit Leader
Tel: +47 5 194 1630
Email: erik.kjeldsen@cae.com

TORONTO, CANADA

Mike Bucking
Training Centre Leader
Tel: +1 905 672 8650
Email: toronto-centre@cae.com

VANCOUVER, CANADA

Mike Bucking
Training Centre Leader
Tel: +1 905 672 8650
Email: vancouver-centre@cae.com

ZHUHAI, PEOPLE'S REPUBLIC OF CHINA

Adrian Yeo
Managing Director
Tel: +86 756 3213388
Email: aviationtraining@cae.com

CAE Listings

ONE STEP AHEAD

CAE GLOBAL ACADEMY LOCATIONS

AMSTERDAM, THE NETHERLANDS

Tel: +023 56 71 722
Email: info-nls@cae.com

BRUSSELS, BELGIUM

Tel: +32 2 752 57 11
Email: info@sfa.be

DOUALA, CAMEROON

Tel: +237 96 97 25 27
Email: info@sfa-a.com

ÉVORA, PORTUGAL

Tel: + 351 266 730 540
Email: evora@caeglobalacademy.com

GONDIA, INDIA

Tel: +91 7182 665000
Email: caeglobalacademy@cae.com

LANGKAWI, MALAYSIA

Tel: +603 2730 5000
Email: inquiries@hmaerospace.com

MONCTON, CANADA

Tel: +1 800 760 4632
Email: admissions@mfc.nb.ca

PERTH, AUSTRALIA

Tel: +1 618 9417 4777
Email: frankduan@cswafc.com.au

PHOENIX, USA

Tel: +1 480 948 4515
Email: phoenix@caeglobalacademy.com

RAE BARELI, INDIA

Tel: +91 0535 2202096
Email: admin@igrua.gov.in

SAN DIEGO, CANADA

Tel: +1 619 631 0323
Email: info@scanavia.com

Improved and Expanded

Guiding the Evolution from TRAINAIR to TRAINAIR *PLUS*

The original ICAO TRAINAIR programme was part of a broader UN initiative that provided much needed competency-based training knowledge, tools and materials to government training providers across multiple sectors for over two decades.

In 2011, after the completion of a comprehensive series of reviews of the core TRAINAIR scope and objectives, ICAO has re-introduced the programme as TRAINAIR *PLUS*—better aligning it with the new ICAO Training Policy and expanding the programme's reach and usefulness for both private- *and* public-sector aviation training providers. The programme now includes significantly revised course development procedures and requirements, a new approach to the Standardized Training Package (STP) sharing library and a self-sustaining budgetary mechanism.

The ICAO *Training Report* spoke recently with Diego Martinez, ICAO TRAINAIR *PLUS* Programme Manager, about the new TRAINAIR *PLUS* tools and objectives and the successes the programme is already seeing as it rises to the challenges of its new mandate.

Diego Martinez

As part of its training reassessment efforts, ICAO has embarked on a detailed review of its successful TRAINAIR programme to support the efforts of States and training organizations in their provision of affordable and high quality aviation training courses.

The ICAO Universal Safety Oversight Audit Programme (USOAP) has revealed that the establishment of a State Training Policy supported by consistent training is one of the major aviation safety oversight deficiencies at the State, regional and global level (64 percent globally).

As an effective tool to implement competency-based and cost-effective training, TRAINAIR *PLUS* plays a critical role in human resource and skills development. Originally, the TRAINAIR programme was part of a broader UN initiative that provided much needed competency-based training knowledge, tools and materials to government training providers across multiple sectors for over two decades.

As part of the evolution from TRAINAIR to TRAINAIR *PLUS*, ICAO has now implemented a more formal assessment process addressing the following critical areas affecting the provision of effective aviation training:

- Organization and official certifications.
- Training delivery.
- Facilities and technology supporting training.
- Instructor qualifications.
- Training design and development.
- Training quality systems.

One of the more significant tasks involved in putting the *'PLUS'* into TRAINAIR *PLUS* was the need to update the programme's methodology so that it would be better suited to the constantly evolving training needs of the modern air transport sector. The previous methodology had been released in 1991, which meant that ICAO's training specialists had a lot on their plate when they embarked on these efforts.

"ICAO's main objective with the updating of the TRAINAIR methodology was to ensure it would now prescribe the course development parameters, material needs and instructor qualifications required so that students would leave their training with the core competencies they would need in the workplace," commented Diego Martinez, ICAO TRAINAIR *PLUS* Programme Manager. "Our primary responsibility is to assist public and private sector aviation training institutions in meeting membership criteria, but our ultimate goal is to provide States and the industry with course graduates who have the knowledge, aptitude and skills they need to perform their jobs as professionals."

Another goal of the TRAINAIR *PLUS* programme is to provide more effective training standardization through a set of courses addressing the development, delivery and management of related programmes. TRAINAIR *PLUS* courses are therefore primarily aimed at training centre management, course developers and

PROVIDING ESSENTIAL TRAINAIR *PLUS* SUPPORT:

The ICAO Aviation Training Directory

The ICAO Aviation Training Directory (ATD) is an essential component of the TRAINAIR *PLUS* programme, providing support for the large and well-connected TRAINAIR *PLUS* international aviation training network. The new and improved online ATD features 5,850 course listings from more than 700 Aviation Training Centres, far more extensive search capabilities and complimentary navigation features.

www. icao.int/td

course instructors. The TRAINAIR *PLUS* methodology brings these stakeholders up-to-speed on the latest trends, approaches and technologies and recognizes training centres based on their ability to provide the standard of graduates now needed by industry.

Martinez stressed that one of the most important priorities in modern aviation training in this regard is to ensure that the environment students learn in is as identical as possible to the environment they eventually work in. This approach has led to the increased use of technology and simulation and to a more focused approach on linking courses with on-the-job training and eventually on-the-job performance.

"It's not enough to say you're producing skilled training graduates," Martinez highlighted. "What the TRAINAIR *PLUS* methodology calls for is for course success to be evaluated based on the success that companies end up seeing in employee performance in the workplace. This is a much longer process and view than had been taken under the former methodology."

TRAINAIR *PLUS* also dramatically simplifies related administrative processes and stresses achieving high quality aviation training standards across a State's entire training community—including both the private and the public training providers.

"Our methodology used to be available only as a private document, which significantly restricted access to it," noted Martinez. "Now it is additionally available to private-sector training institutions as a standard ICAO Document. On the administrative and financing side it's also much simpler now and much less-costly for training centres to introduce new courses. We've reduced the number of reports required for this process from nine down to three and the timeline for evaluation and approval has been significantly reduced without diminishing our course quality appraisals."

One distinction for private training providers arises based on their membership status with the programme. Depending on a number of criteria (available for review via the TRAINAIR *PLUS* brochure and web site) training institutions can qualify for either TRAINAIR *PLUS* 'Associate' or 'Member' status. They also need to be recognized or approved by the State they are located in.

Martinez noted that, in just the first nine months of TRAINAIR *PLUS,* ICAO is on track to assess 22 new training centres as Members and possibly over 30 by the end of 2011.

"The evolution from TRAINAIR to TRAINAIR *PLUS* has been funda-mental on several levels," he concluded. "We have made the pro-gramme simpler and much more cost-effective from an administrative standpoint, both for ICAO internally and externally for global training providers, and we have fine-tuned the metho-dology to help those centres deliver graduates that will be more valued and appreciated by the organizations and companies who hire them than ever before." ■

The Gulf Centre for Aviation Studies

The region's dedicated Airport & Aviation training hub

The Gulf Centre for Aviation Studies (GCAS) was established in 2009 by Abu Dhabi Airports Company (ADAC), the operator of the five major airports in the Emirate of Abu Dhabi, to lead the development of the aviation industry in the UAE and the region through delivering highly qualified aviation professionals. GCAS is the world's first international Civil Aviation Organization (ICAO) TRAINAIR PLUS training centre and a fully certified and endorsed aviation training institution by the General Civil Aviation Authority (GCAA) of the United Arab Emirates, to provide the region with cost-effective training solutions addressing the challenges confronting the industry in the 21st century. Positioned within a world-class international business aviation airport, GCAS offers airport and aviation employees a combination of theoretical and practical leading training modules to promote best practice in the various sectors in aviation. GCAS offers a combination of internationally acclaimed programmes, which were once only available outside the Gulf region, along with tailored modules specific to the needs of the local and regional aviation industry.

An Internationally Acclaimed Institution

GCAS is the world's first 'TRAINAIR PLUS' training centre for its technical expertise, training resources and quality assurance system providing the best possible aviation training together with its internationally recognised partners.The Joint Aviation Authority- Training Organization (JAATO) has announced GCAS to be their exclusive training provider for the Gulf and the Middle East region. The centre is also one of the Airport Council International's (ACI) global training hubs, and a partner of Safe Passage International (SPI) - a global supplier of computer-based and web-based training programmes for the aviation, cargo, judicial, maritime and general security industries. GCAS has received many prestigious awards, including the accolade of 'Training and Education provider of the year 2010' at the Aviation Business Awards.

Partners:

Berlitz

Safe Passage International

TRAINAIR PLUS

GCAS
مركز الخليج لدراسات الطيران
GULF CENTRE FOR AVIATION STUDIES

The World's First
TRAINAIR PLUS Member

- GCAS has been awarded the world's first TRAINAIR Plus membership from the International Civil Aviation Organisation (ICAO)
- Trainair is a system to improve safety and efficiency of air transport through the establishment and maintenance of high standards of training and competency for aviation personnel
- The Trainair Plus programme will allow GCAS to share its educational resources with other members promoting the country's knowledge sharing and exporting capabilities

A Quality Curriculum for International Best Practice

GCAS has designed a diversified and comprehensive curriculum with high quality programmes and training options. GCAS is committed to furthering the collective expertise and knowledge base in the aviation industry, and providing training solutions for all key aviation organisation's in the region and the world.

International Expertise Available in Abu Dhabi

GCAS provides first-hand experience of the Gulf region; leading the world in terms of airport operations, airport infrastructure, air traffic growth and airline development. GCAS has its own dedicated facilities at Al Bateen Executive Airport in Abu Dhabi where our accredited courses are taught. It is one of the few aviation training centres in the world located in an operational airport, thus enhancing the educational experience. We have a team of talented specialists and instructors, all whom are highly qualified and experienced industry professionals. Brand new state-of-the-art facilities with six lecturing theatres, five training rooms, a business centre, library, recreational centre, breakout area, e-learning facilities, dining hall, high-speed internet coverage (Wi-Fi) and on-site catering.

Gulf Centre for Aviation Studies- Division of Abu Dhabi Airports Company PJSC
PO Box 94449 Abu Dhabi,United Arab Emirate
T +971 2 49 42 355, F +971 2 49 42 366, **www.gcas.ae**

Operated by:
ADAC
شركة أبوظبي للمطارات
ABU DHABI AIRPORTS COMPANY

Ensuring Talent Supply Meets Demand for Tomorrow's Air Transport Industry

Shifting workforce demographics, talent shortages and skills gaps continue to be shared concerns as the industry moves to meet the demands of a world increasingly in flight.

Ismail Albaidhani, Head of Distance Learning, Organization and Performance at IATA's Training and Development Institute, discusses the challenges and the solutions that surround the near- and medium-term skilled personnel shortage projections for aviation, including why it will be important to provide training to next generation aviation professionals that engages as well as instructs.

Ismail Albaidhani is the Head of Distance Learning, Organization and Human Performance at the IATA Training & Development Institute (ITDI). He leads the industry professional development programs in the aviation, cargo, travel and tourism sectors. In addition to his role at IATA, Albaidhani is a member of the Advisory Boards and the Scientific Committees of the University of Geneva Aviation Management Program, and the Stanford Aviation Management Diploma. He also lectures on Strategy and Project Management at the University of Geneva and ITDI in several locations. Albaidhani is also a member of the Next Generation of Aviation Professionals (NGAP) Task Force. Prior to his current role, he held several positions in Human Resources in IATA executive office in Switzerland, as well as in the Industry Distribution & Financial Services in IATA Middle East & Africa regional office in Jordan.

Looking to the future, aviation stakeholders are confronted with a pressing human resource challenge: how to ensure we have a strong supply of skilled, competent, personnel to meet the demands of the global air transportation system of the future. Some of the considerations that arise in this regard include:

- In the next 20 years, airlines will need to add 25,000 new aircraft to the current 17,000-strong commercial fleet.
- By 2026, we will need 480,000 new technicians to maintain these aircraft and over 350,000 pilots to fly them.
- Between 2005 and 2015, 73 percent of the American air traffic controller population is eligible for retirement.

Aviation will also need thousands of airline customer service personnel, air and ground crew and cargo handlers, not to mention many other aviation-related professions—such as travel and cargo agents—to meet the dramatic growth in the aviation industry.

Addressing the Next Generation Challenge

This labour shortage is a challenge the IATA Training and Development Institute (ITDI) has been working actively to address with other partners. ITDI is the leading provider of global aviation training solutions and professional development programmes, training 30,000 professionals every year. These graduates attain the latest skill levels demanded by the aviation industry and have access to IATA's network of more than 230 member airlines and 70,000 accredited travel agents.

In recent years, ITDI has been using its capabilities – its resources, people and know-how – to help the industry build the capacity to address its looming talent shortages. In conjunction with ICAO, ITDI has been closely involved in the initiatives of the Next Generation of Aviation Professionals (NGAP) programme, which was launched to ensure that enough qualified and competent aviation professionals are available to operate, manage and maintain the future international air transport system.

A Call for Innovative, Immediate Solutions

As aviation competes with other industrial sectors for highly skilled professionals, the solutions to attract and retain the best and brightest will be multi-faceted. These solutions will focus on ensuring that all interested candidates have access to quality and affordable aviation education and training. Solutions must also leverage technology to its fullest, utilizing distance learning and e-learning platforms as well as the latest consumer electronics products and telecommunications services.

It will be equally important to provide training that engages as well as instructs in order to stimulate the minds and retain the attention of the young people who will become contributing members of the next generation of aviation professionals. Once trained, it will be critical to more effectively match these skilled graduates with the employers who need them. This can be accomplished by increasing awareness in the 'next generation' training graduate of the types of aviation jobs available to them, as well as by better informing potential employers of the available talent pool.

Solution 1: Increase Accessibility to Industry Training

ITDI's internationally recognized programmes reflect the changing needs of our

industry and cover all areas of the aviation industry. Amongst hundreds of courses provided each year, ITDI offers training in general aviation areas such as airport operations, airline customer service, security and safety, all aspects of working in travel and tourism, as well as the basics for a career in the cargo industry.

The global reach of ITDI's training offerings facilitates accessibility to students from the far reaches of the world. The company leverages a pool of over 330 highly qualified instructors based in 50 locations worldwide, including six state-of-the-art IATA Training Centers located in Montreal, Miami, Geneva, Singapore, New Delhi and Beijing.

Solution 2: Leverage Technology to Maximum Advantage

The power of technology will figure prominently in engaging the next generation of tech-savvy aviation employees. In our wireless world, attracting candidates to the industry will mean providing them with more accessible and cutting-edge training solutions.

Technology transcends borders, opening affordable distance learning opportunities to interested candidates from developing nations while ensuring the quality of the training remains consistent.

ITDI's distance learning programme offers all the benefits of an instructor-led classroom education without trainees having to relocate. The environmental benefits that technology brings to training—less travel, less paper—are also powerful incentives to action.

ITDI harnesses the power of technology for maximum impact. Its innovative e-learning solutions can be accessed via a number of platforms, including CD-ROMs, mobile devices and e-books, or else delivered directly to the student with the revolutionary Apple iPad.

Solution 3: Provide Leading-edge Training Solutions that Engage

To attract and retain people to the aviation industry we cannot be satisfied with the status quo in training techniques. The industry must invest in developing leading-edge training solutions that not only ignite the imagination of potential candidates but give them the skills and knowledge to develop their professional qualifications and advance their careers.

ITDI's self-paced, e-learning platform provides flexible training options for busy people to hone their skills. Courses vary from quick refreshers to in-depth programmes requiring more than 40 hours of study. The e-learning sessions also offer the desired flexibility of studying anywhere, anytime to acquire the needed skills.

To give students a competitive edge and take training one step further, ITDI has forged partnerships with a number of prestigious institutions of higher learning, including Harvard University and Stanford University. The programmes offered under these agreements provide students with the opportunity to earn a prestigious business diploma with specialization in aviation management.

Students can earn a joint diploma from IATA and the faculty of Harvard Business School that combines world-class IATA distance learning with components of Harvard ManageMentor – the highly acclaimed e-learning programme from Harvard Business Publishing.

The Stanford-IATA Aviation Management Programme is also a distance learning programme, combining business management and aviation training with the goal of developing new aviation leaders to guide the next century of excellence in air transport.

IATA also offers joint Executive MBA degrees through partnerships with the University of Geneva and the Nanyang Technological University. All the university partnerships forged by IATA represent an alternative model in training excellence that could have potential for wider application in the industry.

Solution 4: Connect Talent Supply with Corporate Demand

While there is a need to continue to develop the existing pool of trained aviation professionals, there exists a talent base of aviation employees who remain largely untapped. These are aviation graduates who are ready and willing to work yet are simply unaware of the rich repository of employment opportunities. Jobs go unfilled to some extent in the industry because employers and prospective candidates are not as well connected and networked as they might be.

ITDI is working on initiatives to match talent supply with industry demand by offering member airlines reliable human resource data to help in their recruitment efforts. For example, ITDI's successful job placement programme connects newly-trained talent with the employers who need them. ITDI provides member airlines, accredited cargo agents and travel agents with details of all new ITDI graduates in their locations, including their programme of study, to help in corporate recruitment efforts. This solution is enabling businesses to be more productive, more competitive and quickly fill vacancies with skilled resources.

Conclusion

All of the solutions to the human resources challenges faced by the global air transportation system are well within our grasp. A collective will to address shared concerns, followed by decisive action, should begin to show results in the short-, medium- and long-term. Most importantly, our efforts will help create a brighter future for one of the world's most dynamic and vital industries. ■

The AMPAP Associate Diploma

Bringing the Value and Benefits of a Proven Global Airport Training Approach to a Wider Range of Public- and Private-sector Air Transport Stakeholders

In today's airport world, rapidly-evolving political, economic and technological forces are continually reshaping the industry's traditional regulatory and operational landscape. Recognizing that a top-notch management team can make all the difference in such a competitive and evolving industry, ICAO joined forces with Airports Council International (ACI) in 2007 to develop a groundbreaking global training initiative: the Airport Management Professional Accreditation Programme (AMPAP).

As outlined in this interview with Lia Ricalde, Aerodromes & Ground Aids Regional Officer in the ICAO South America (SAM) Regional Office, Lima, the benefits of the AMPAP training approach bring valuable perspective and skills not only to airport employees, but additionally to the wide range of air transport stakeholders whose responsibilities can benefit from improved knowledge and understanding of airport operations and business needs.

In only four years of the ACI-ICAO AMPAP initiative's existence, it has welcomed over 500 participants from 80 nations worldwide. The programme has also recognized over 100 airport managers who have earned the International Airport Professional (IAP) accreditation by completing the AMPAP six-course curriculum within a prescribed three-year timeframe.

The AMPAP curriculum, which consists of four mandatory and two elective courses, is offered in both face-to-face and online formats. It covers all functional aspects of airport business in key areas such as operations, security, finance, commercial management and airport development. Each course emphasizes adherence to uniform standards and industry best-practices while facilitating a cross-cultural learning environment for its participants. This global approach has served to establish a worldwide AMPAP community which interacts regularly and optimizes knowledge-sharing today among the world's airports.

ICAO Secretary General Raymond Benjamin, as well as his immediate predecessor, Taïeb Chérif, have lauded the AMPAP curriculum and its benefits to ICAO's Member States. Although airport executives are the core target for AMPAP, airport-industry stakeholders, such as ICAO and ACI staff, are also strongly urged to participate in AMPAP because they bring invaluable perspective to classroom debates.

To help encourage this participation, airport-industry stakeholders who complete the programme's four mandatory courses are entitled to a special AMPAP Associate Diploma. As the ranks of Diploma holders continue to grow, many others are accelerating their participation to follow suit.

ICAO's first recipient of the AMPAP Associate Diploma was Lia Ricalde, Aerodromes & Ground Aids Regional Officer in the ICAO SAM Regional Office in Lima, Peru. Ricalde recently spoke with the AMPAP team to discuss her impressions of the Diploma programme.

AMPAP: What specifically motivated you to enroll in AMPAP?

Lia Ricalde

Lia Ricalde: ICAO has provided me with an excellent opportunity to work very closely with State Civil Aviation Authorities. AMPAP, on the other hand, has allowed me to experience a broader cross-section of the civil aviation community. I considered before enrolling with AMPAP that understanding the needs of aviation stakeholders could help me in my work with ICAO's Members, not to mention that improving my expertise has always been an important personal challenge.

You took part in the AMPAP gateway course in Montreal in May 2010, which brought together a dozen airport managers, several ACI World Business Partners, and four ICAO personnel including yourself. How did you find the collaboration with this diverse mix of specialists, particularly during the group projects?

Considering the different backgrounds, experiences, languages and parts of the world that the participants came from, it was nonetheless easy to find common ground give the high priority we all attributed to safety in commercial aviation. The group was comprised of five members from five different airport fields, four different languages and continents. The group projects were a real challenge, not because of the language barrier, but because the varying perspectives of participants from different fields led us to redefine our individual understanding about commercial aviation. The synergy in the group was great since we all shared the common goal to deliver the best project possible. Everybody collaborated equally to deliver an innovative result.

Your AMPAP experience meant that you had to complete the four-course curriculum, covering all functional areas of an airport business, from safety and security to commercial and financial operations, planning and development. How has this enhanced knowledge contributed to your role at ICAO?

ICAO understands the importance and necessity of appreciating other stakeholder perspectives in the aviation community. As such, the AMPAP experience has allowed me to develop a much better understanding of the needs of the broader range of air transport stakeholders regardless of whether they are part of my field of expertise or not. One cannot be an expert in all the areas, but AMPAP has provided me with enough material and perspective to have a much deeper grasp of additional priorities in aviation, such as security and commercial and financial operations.

You earned the joint ACI-ICAO AMPAP Associate Diploma in less than one year… What was the toughest challenge you faced in completing your coursework in such a short timeframe?

Finding the time to attend the online weekly meetings. To me this was the most important part of the programme's three online courses, especially since participants are given the opportunity to ask questions of live instructors.

Now that you are an AMPAP graduate, in your opinion what is the advantage to a civil servant who joins a community comprised mostly of airport personnel?

The main benefit is to understand how new regulations can affect the operational safety in airports due to difficulties in their implementation. States adopt new ICAO SARPS in their national regulations that provide for safer operations. When the implementation of these SARPs takes years before being completed, however, they become safety deficiencies for ICAO. This process can be better managed by regional civil personnel when we have a better understanding of how an airport is managed.

AMPAP material can help to bridge gaps that can occur between ICAO regulations and airport managers. Would you say that your fellow participants were very engaged by this aspect of the course content?

My fellow participants were absolutely engaged by the course material, primarily because airports are treated as businesses and the importance of following the rules is not always clear from a business standpoint or are simply misunderstood. The AMPAP programme has incorporated the ICAO SARPS in its content and a good number of my fellow participants learned for the first time where certain regulations came from and why they must be implemented. ICAO's contribution has been to clarify those regulations in real-life scenarios.

How would you describe the world AMPAP community and its influence or benefit vis-à-vis your professional network?

First and foremost, it's a great idea having an AMPAP community. I have found long-lost colleagues in the airport businesses who are also AMPAP graduates and the community is very helpful in my current position since I now have access to first-hand and real-time airport information. Obviously, my professional network has increased significantly considering the worldwide reach of the AMPAP programme and I'm also happy to be able to provide a similar increase in perspective and resources for my AMPAP network colleagues.

Is it widely known among your colleagues at ICAO that AMPAP recognizes their participation in the four mandatory courses with the AMPAP Associate Diploma?

The Air Navigation Bureau Director and the Aerodromes Section Chief have been very supportive of the AMPAP programme. They have encouraged the participation of ICAO personnel. However, I think the ICAO technical and regional officers, due to their busy agendas, have very limited time to be involved in training programmes such as AMPAP. Personally, I am very thankful for the great support and interest from the ICAO (SAM) Regional Office, which has allowed me the time and resources to participate and complete the AMPAP programme. Although ICAO initially invited only the Aerodromes Officers to participate, I strongly believe that officers from other areas will also benefit from this programme. ■

Changing the Tires at 100kph

New ATM programmes and concepts now being envisaged, such as global block upgrades, illustrate a new model of continuous modernization.

As Dr. Ruth Stilwell of the International Federation of Air Traffic Controllers' Associations (IFATCA) writes, this is a very different view than earlier efforts where major changes were achieved in large and notably distinct segments. These previous 'big bang' approaches, featuring training objectives that were isolated into short timeframes, are now being evolved into more phased ATC training approaches characterized by longer-term training demands.

An air traffic controller at Miami Center for the last 20 years, Ruth Stilwell is the current IFATCA representative to the ICAO Air Navigation Commission. Prior to her service to IFATCA, Stilwell served as NATCA's Executive Vice President for six years, chaired the Air Traffic Services Committee for the International Transport Workers Federation (ITF), served on President Obama's Transportation Policy Committee during his 2008 Presidential Campaign, and served as NATCA's liaison to the Air Traffic Requirements service. She additionally served on the RTCA Surveillance Committee and chaired NATCA's National Legislative Committee.

For air traffic controllers, training is a career-long activity. In addition to the employment enhancement opportunities offered to qualified controllers who seek transfers or additional ratings, air traffic controllers face requirements for periodic refresher training, as well as training on new equipment and procedures implemented throughout their careers.

In just a few decades, air traffic control systems have evolved from this:

Source: Federal Aviation Administration

To this

Source: National Air Traffic Controllers Association

The challenges with respect to recruiting, selecting, and training air traffic controllers are well known and have been addressed in several studies. While there have been adjustments and modifications to the process of ab initio training for controllers, the basic framework remains unchanged. Combinations of academic, simulator and on-the-job training are created and adapted to meet the specific needs of the provider.

Studies into effective recruitment and retention systems add value to the process but, no matter how great the challenge to meet the basic air traffic control staffing needs, initial qualification training is only a small portion of the overall training demands on the system.

Rather than discuss how we train an air traffic controller, it is important to ask another question: how do we provide quality and comprehensive training to the current controller workforce on new technologies, tools, and procedures to implement new systems, while simultaneously continuing to operate the air traffic control system and devoting considerable training resources to ensuring there are adequate numbers of new controllers to meet future demands?

In 2008, Starbucks closed every store for three and a half hours for employee training, stating:

> *"We will close all of our U.S. company-operated stores to teach, educate and share our love of coffee, and the art of espresso."* [1]

As much as we want to teach, educate and share the love of aviation and the art of air traffic control, the first priority is to the safe, orderly and expeditious flow of aircraft. Shutting down the air traffic system, even for a few hours, is simply not an option.

All footnotes collated at end of text on page 40.

It's for this reason that some often remark that implementing new systems and procedures in ATC is like trying to change the tires on a car while it's going 100kph.

Additionally, air traffic controller staffing models and workforce planning generally focus on traffic levels as the measure of controller workload. The concept of 'staffing to traffic' is widely used. The FAA defines the concept in this way:

> *""Staffing to traffic" requires the FAA to consider many facility-specific factors. They include traffic volumes based on FAA forecasts and hours of operation, as well as individualized forecasts of controller retirements and other attrition losses."* [2]

Similarly, in Europe, ATC staffing levels are defined relative to operation positions:

> *"Staffing in ATM is defined as resourcing ATC Operations with competent staff at all required operational positions to provide a safe, orderly and expeditious flow of traffic within the capacity declared by the Air Traffic Service (ATS) unit, including periods of known or unknown workload extremes and/or degraded system operations."* [3]

Neither model includes demands for recurrent and new-systems training in the development of staffing models.

In the past, large Air Navigation Service Providers (ANSPs) have utilized periods of relatively stable staffing levels to implement technology upgrades. This approach relies on certain assumptions: first, that equipment and procedure specific training can be accomplished by utilizing overtime to meet staffing needs; and second, that this type of training need is an infrequent event.

While these may have been coincidental circumstances, rather than the result of planning, it is not an opportunity ANSPs are likely to encounter again in the near term. The challenge of meeting the demand for training to provide base levels of staffing to meet current and future traffic levels, while at the same time providing the necessary training on new equipment and procedures that promise to increase system efficiency and capacity, is not unique to a given provider.

System training, in contrast to air traffic skills training, needs to consider the long-term modernization philosophies in the industry. This presents a new challenge for ANSPs. The current concepts of new programmes and global block upgrades illustrate a model of continuous modernization in which new tools, procedures and technologies are brought online over time. This is a very different view than earlier efforts, where major changes were done in large chunks. This former 'big bang' approach isolated training demands into short periods of time, whereas the new, phased approaches create longer-term training demands.

"Traditionally, the resource model for training the existing workforce on new systems has generally been included in the programme definition and, as a consequence, these needs may not be adequately weighed against the demands placed on training resources by initial qualification training of air traffic controllers."

While more study can be done on balancing the allocation of training resources to meet these parallel challenges, the problem is not unknown. Nearly a decade ago, ANSPs were already expressing concern:

> *"The world of ATC is rapidly changing – new systems are coming on line and a revolution in operational methods is on the horizon. Training programmes, methods and techniques must not just keep pace but precede developments in the field, and innovation and vision in ATC training is just as important as innovation and vision in ATC provision."* [4]

Notwithstanding the awareness of the issue, it is rare that the risk associated with strained training capacity is considered in the models for hiring plans or programme implementation. These issues should not be segregated in planning exercises.

In one of the most scrutinized cases, that of the FAA, voluminous studies, audits and oversight reports on both the need to hire thousands of air traffic controllers and the implementation challenges of the Next Generation (NextGen) air transportation system, the training demands to implement NextGen is rarely mentioned.

In his testimony in a Congressional Appropriations hearing, the US Department of Transportation Inspector General barely touched upon the issue by stating:

> *"At the same time, FAA faces several organizational, policy, logistical, and training challenges that could impede NextGen implementation in the midterm, including working across diverse agency lines of business."* [5]

The absence of coordinated planning strategies, needed to meet the competing demands on resources of training new controllers while training the existing workforce, is surprising in light of the extensive experience ANSP's have with recurrent, refresher and upgrade training of certified air traffic controllers. It is well-known and accepted that an air traffic control system cannot evolve without considerable training of the certified air traffic controller workforce.

Traditionally, the resource model for training the existing workforce on new systems has generally been included in the programme definition and, as a consequence, these needs may not be adequately weighed against the demands placed on training resources by initial qualification training of air traffic controllers.

The Single European Sky ATM Research (SESAR) programme documentation reinforces the segregated training approach. In the SESAR definition phase, the consortium concluded:

> *"The careful definition of training programmes in the increasingly automated ATM environment is paramount, especially e.g. for degraded mode operations. The quantitative manpower requirements for such continuation training have to be addressed in deployment planning."* [6]

By relegating this training to the deployment planning stage of modernization programmes, ANSPs may fall short of fully optimizing training resources at best and, at worst, create a scenario where deploying modern systems will come at the expense of safe staffing levels.

In order to prevent these outcomes, ANSPs should consider desegregating these activities and developing comprehensive training models that consider the competing demands placed on training resources. If we are to follow the philosophies of the major modernization programmes then we must also accept that continuous training of the certified workforce will be an ongoing effort.

This new reality should be incorporated into staffing models where we not only consider the current operational needs and traffic volumes, but also the training demands placed on individual controllers. ■

Footnotes:

1. Howard Schultz Transformation Agenda Communication #8. Starbucks. February 2008.
2. Federal Aviation Administration. *A Plan for the Future: 10-year Strategy for the Air Traffic Control Workforce 2011-2020*. 2011.
3. Eurocontrol. *Selected Safety Issues for Staffing ATC Operations*. European Air Traffic Management. 2007.
4. NATS. *ATC Training: NATS Looks to the Future*. Air Traffic Solutions. 2002.
5. Statement of the Honorable Calvin L. Scovel III, Inspector General US Department of Transportation, the Federal Aviation Administration's Fiscal Year 2012 Budget Request: Key Issues Facing the Agency. May 12, 2011.
6. SEASR Consortium. SESAR Definition Phase, WP1.7.2/D2, DLT-0607-172-00-05-172-D2, Recruitment, Training, Competence and Staffing. 2006.

Training Philosophy Guiding Training Technology

Improving Simulator-based Training Success Rates at Danish ATC Provider Naviair

Naviair, the Danish centre for air traffic control, undertook a significant competency-based training program in 2009 known as PEC (Participant-oriented Educational Concept).

Gert Rosenkvist & Geert Allermand, Chief consultants at SIMU-learning, in cooperation with air traffic controllers Tom Laursen and Ulrik Leve of Naviair, describe the training philosophies under-scoring the PEC approach and how it has lowered ATC trainee failure rates from over 40 percent to below 17 percent.

The training of air traffic controllers with the help of simulators has been the practice in Denmark for many years. This training involves a mix of theory and simulator training, with the emphasis clearly on simulator training, and it is understood to be an essential component in maintaining Naviair's highest priority, which is safety in air traffic movements.

At 400,000 Euros, training a Danish air traffic controller is very costly. Over two and a half years, trainees are overseen by a trained air traffic controller it becomes very costly should a student not meet their set targets—requiring their training to be terminated.

Cost-benefit factors therefore provide strong motivation for optimizing every aspect of Danish ATC training and maintaining high applicant retention and training completion levels. Well-qualified instructors play a vital role in this regard and Naviair satisfies this need by qualifying all of its ATC professionals as instructors as well as controllers. Additionally, significant attention is paid to applicant screening.

Optimization of Teaching and Learning

Every Danish air traffic controller or air traffic controller assistant completes a basic teaching course following two years of service. After this initial qualification has been achieved the instructor then has to take a brush-up course every third year. Completing the basic course as well as attending the tri-annual refresher courses is a prerequisite for working as an ATC instructor.

In order to optimise the training of air traffic controllers, simulators are frequently employed and are adjusted to the various stages of development through which the trainees progress. Simulators allow students to experience a virtual Danish airspace which is very close to the real thing. This includes radar notifications, virtual pilots, wind and weather, as well as aircraft manoeuvring in accordance with established ATC guidelines.

For 14 years, Naviair collaborator SIMU-learning.com has worked with Force Technology on a special simulator-based training concept for air traffic controllers. Based on previous successes seen with partners such as Venice Pilots, the South Africa Maritime Training Academy (SAMTRA), Caribbean Maritime Institute, Jamaica and Vikingline, Naviair and Simu-learning formalized their cooperation on ATC training in 2008.

Research from recent decades has pointed to some increasingly well-founded assumptions regarding adult learning; namely that the development of competencies must involve practice and that learning is a relational, social activity. This theory represents a much more complex activity than earlier 'rote' philosophies had assumed and is based three fundamental concepts

1. Focusing on a desired goal (the participant's goal).
2. Basic confidence (the participant's belief in his or her own abilities and faith in the positive intentions of any assistants).
3. Focusing participant attention on the present and what is happening (not on what should have happened or should be happening).

The PEC concept builds on this understanding in that its teaching processes are structured in such a way that become subjected to the participant's way of thinking as opposed to the instructor's preconceived notions or the logic of the subject matter.

When training consistently meets the participant on their own level, stimulating and then closely following the participant's learning processes, the possibility that the subject matter will be more deeply and effectively integrated into the participant's understanding is much greater than less tailored 'implanting' approaches.

Simulators allow students to experience a virtual Danish airspace which is very close to the real thing. This includes radar notifications, virtual pilots, wind and weather, as well as aircraft manoeuvring in accordance with established ATC guidelines.

Danish philosopher Søren Kierkegaard elaborated this student-focused approach to learning over 150 years ago and several theorists have since followed in his footsteps. The basic premise is that trainers and educators must first understand what the learner understands before they can optimize the retention of new information.

Part of this process entails the participant's understanding being challenged and 'disturbed', such that they become more actively involved in creating a new and greater understanding/mastery. This active collaboration strongly underlies the PEC concept.

As Kierkegaard pointed out, all learning involves the courage necessary to lose your footing for a moment. This fact makes the psychological framework where learning occurs incredibly important to any outcomes. The trainee also has to *want* to learn and be able to see the benefits from doing so.

The importance of motivation and of insisting on active contribution to the learning process therefore cannot be emphasized enough. This must be incorporated into the distribution of roles, the training methodology and the overall learning environment.

Yet another cornerstone of effective learning underlying the PEC pertains to reflection. Experiences do not become lessons until they are properly processed and yet, despite the importance of this point having been highlighted in many studies over recent decades, reflection is too often neglected.

The view of learning and the practice connected with it was also specifically thought out and developed according to SIMU-Learning's many years of working with organizational learning, and especially the question of how to ensure the maximum effect of the concepts of education and training which are used. That is, the question of *transfer*.

The Participant-oriented Educational Concept

A number of education and development projects demonstrate poor or no transfer between training initiatives and organizational outcomes. Training participants may express a high degree of satisfaction when evaluating their programmes, but personal satisfaction is not a good yardstick for effective organizational learning.

When Naviair and SIMU-learning planned and developed the PEC concept, therefore, it was established early on that increased transfer should be a priority objective. High transfer is a prerequisite in order for the organisation's investment in the project to yield a return.

Latest research on transfer between the education and work environment points to a number of factors which increase this affect, including:

- That the trainee can draw the connections between what is being learned and what their job requires.
- That there is a realistic objective in terms of applying the material learned.
- That the educational environment closely mirrors the workplace environment.
- That focus is maintained on workplace social relationships, including support from colleagues, management, etc.

To ensure this creation of value for the organisation through more effective train ing transfer, Naviair and Simu-learning designed the PEC through the stages noted in the sidebar box, below.

COURSE DESIGN STAGES FOR AN EFFECTIVE PEC

1. **Selection of instructors (interviews, references).**
2. **Analysis and research**
   - Observation of the present debriefing practice. What works well already?
   - Identification of development needs and organisational, structural and cultural barriers.
   - Workshops (final definition of development plan, including criteria for success, milestones and timelines).
3. **Education and training**
   - Education and training of relevant groups of instructors (chief instructors, course leaders, senior instructors) with subsequent supervision of the transfer into practice.
   - Planning which makes sense to the participant.
   - Debriefing methodology.
4. **Planning and organization of teaching**
   - Adjusting course descriptions, statements of aims, materials, and exercises.
   - Support for the establishment of a self-sustaining appreciation and team culture among the instructors.

Selection and Training of Internal PEC Instructors

The selection and training of 18 internal PEC instructors was intended to ensure that Naviair had its own expertise available in this regard. These individuals were then responsible for training, retraining and supervising approximately 300 local instructors (known as OJTI's) responsible for the practical ATC training.

This process was a collaboration between internal chief instructors with daily knowledge of possible candidates, the project management team and external consultants. In addition to relevant experience and competencies, great emphasis was put on the attitude towards the

INTERNATIONAL AIRPORT PROFESSIONAL

Global ACI-ICAO Airport Management Professional Accreditation Programme (AMPAP)

I chose AMPAP

"It's the only programme of its kind that provides airport managers with a graduate-level curriculum that leads to a joint accreditation from ICAO and ACI, the industry's most influential global organizations. For me, AMPAP equips its participants with a robust understanding of the strategic and operational perspectives of aviation and airport management. It also opens a gateway to its active worldwide community, which shares and promotes industry best practices."

Robert W. Kennedy, IAP,
Interim Deputy General Manager,
Hartsfield-Jackson Atlanta International Airport

Premier Sponsor	Media Partner	Information	AMPAP Administrator
SITA	Air Transport News	www.iap.aero	Aviation Strategies International

role of 'norm setter' in relation to the colleagues with whom instructors worked on a daily basis.

In this way, PEC principles were applied throughout the organization and, in principle, the project became self-supporting and less dependent on external consultants.

Supervision

From the onset, supervision stages were incorporated into several levels of the project in order to ensure a high degree of transfer. The first level of supervision was formed by having instructors own trainees. The second level operated between instructors and via the facilitators and coaches involved with the training and education of other instructors (OJTI's).

Effective supervision made the consultants much more aware of the possibilities and limitations of using PEC in the workplace environment, both in terms of more general issues (such as values in the company culture), but also in terms of entirely practical aspects, such as the possibility of carrying out debriefing between instructor and trainee in favourable physical surroundings.

Customer as 'Co-builder'

The PEC concept was designed so that the customer acts as a 'co-builder' in the continuous development and design of the project. External consultants deliver the foundation – the view of learning, theoretical basis and methodology – then together with Naviair the remaining elements of the course structure are planned and built. The role of the external consultants in this sense is one of 'learning architects'.

Appreciative and Approving Approach

The PEC concept is based on an appreciative and approving approach towards learning and development. This implies being respectful and approving of the competencies, culture and values found in the organization.

In the Naviair project, Simu-learning presented its observations at a workshop where a number of the most important players were present. The purpose of this workshop was to turn the participants into active players in the process and get feedback on the observations carried out.

Appreciative and approving education is the foundation of the whole PEC approach to learning, and is a cornerstone in all the interventions found in PEC: training and supervision as well as debriefings between instructor and trainee.

Instructors as Facilitators not Experts

An effective PEC requires that the individual instructor abandon their role as expert and take on the role of facilitator. The instructor therefore supports and controls learning processes together with the trainee and helps the trainee reflect on the simulator training or on an air traffic situation.

Pre-briefing and De-briefing

In order to support the instructors in their role as facilitators, the following concept for pre-briefing and de-briefing was employed:

- *Pre-briefing*
  Target and focus of the subsequent exercise/traffic situation. The purpose of pre-briefing is also to enter into a psychological contract, thereby balancing mutual expectations so that both parties are aware of their context and role.
- *Simulator Training*
  Adjustment of appropriate challenges.
- *Debriefing*
  Furthering awareness and reflection of the participants regarding their incentives for actions and for qualifying their actions.

The questioning methodology used by the instructors in connection with pre- and debriefing can be divided into: information questions (defining and delimiting); relational questions (exploring relations and contexts); hypothetical questions (encouraging new perceptions and views); and behaviour-affecting questions (influencing a change in thinking and behaviour).

Instructor/Trainee Relationship

Under previous training approaches, the instructor would be in charge of formulating objectives for exercises, carrying out pre-briefings and carrying out a relatively short debriefing (generally an assessment of the trainee). The distribution of speaking time was roughly 80 percent for the instructor and 20 for the trainee.

In contrast, PEC prescribes that instructor and trainee find joint objectives and extract learning together, thus putting the trainee in a position of competence. In this position they will feel that they can directly influence what is to be learned and where they are in the process.

Through this approach the foundation is laid for a training environment where mistakes and alternative solutions are no longer penalized; becoming instead situations from which valuable learning can be extracted.

Successful Results

The training of air traffic controllers has traditionally been subject to a very high failure rate in the simulator module, fluctuating between 40–100 percent of a class. After the first two courses using the PEC approach, Naviair failure rates in the simulator module have fallen to between zero and 17 percent.

There are obviously many factors that can influence these numbers but, over and above the decreasing failure rates, the experiences and lessons found in the instructor work is promising and it is felt that a seed has been sown in terms of making learning a more collaborative and successful effort between instructor and student.

The continued consolidation of the Naviair PEC project depends on the coordination of many initiatives on several levels. The organisational culture and involvement of management are two essential aspects of this realization. While the PEC project challenges several traditional theories of learning, it is in harmony with a series of other current changes within management concepts and organizational development. ■

SINGAPORE AVIATION ACADEMY

Developing Talent for Global Aviation

34th ICAO Edward Warner Award

1996 Flight International Aerospace Industry Award

An internationally-recognised institute with **4** **specialised schools** delivering **more than 100 programmes** annually.

To-date, it has trained **over 52,000 participants** from **190 countries.**

Tel: (65) 65406209 / 65430433 Fax: (65) 65429890 / 65432778 Email: saa@caas.gov.sg **www.saa.com.sg**

A Division of the Civil Aviation Authority of Singapore

Upgrade your competencies!

Get the IATA internationally recognized qualifications you need to succeed in the aviation, travel and tourism industries.

Give yourself a leg up on the competition for the best jobs by enrolling in one of our courses!

- International Aviation Training programs
- International Travel & Tourism Training programs
- International Cargo Agents Training programs
- IATA-Harvard Leadership & Management Training programs

How you benefit from IATA training:

- We train **30,000** young people worldwide every year and give them the skills required to find a job.
- We have over **330** training partners worldwide.
- We have established a highly esteemed Academic partnership with **Harvard** and **Stanford**, **Nanyang Technical University**, **University of Geneva**.
- IATA has a network of over **70,000** travel agents and 230 airlines who look for IATA graduates when hiring.
- With more than **250 million** job opportunities, we have the highest job placement industry in the world!

STANFORD UNIVERSITY
Stanford Center for Professional Development

HARVARD BUSINESS PUBLISHING

NANYANG TECHNOLOGICAL UNIVERSITY

UNIVERSITÉ DE GENÈVE

IATA – Your key to getting the job you want!

Enroll today:

www.iata.org/training-atc