ICAO TRAINING REPORT

NEWS AND FEATURES ON CIVIL AVIATION-RELATED TRAINING DEVELOPMENTS - VOL. 5 - NO. 1

TRAINING AND CAPACITY-BUILDING

A MESSAGE FROM ICAO'S COUNCIL PRESIDENT

ALSO IN THIS ISSUE:

PREDICTING TEAM PERFORMANCE
AVIATION SECURITY TRAINING
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Contents

Dr. Olumuyiwa Benard Aliu, *President of the Council, ICAO*

MESSAGE FROM DR. OLUMUYIWA BENARD ALIU, PRESIDENT OF THE COUNCIL, ICAO

Training and capacity-building are increasingly important activities in ICAO, notably as human capital development is so fundamental today with respect to aviation's continued safety, efficiency and sustainability long into the future. With our sector set to double in capacity by 2030, there is simply no room for complacency where aviation's need for skilled personnel is concerned.

To reflect this importance in a concrete manner, ICAO first established a dedicated Global Aviation Training (GAT) Office in 2014 to coordinate all of our activities in this field. We subsequently launched a **No Country Left Behind** programme at the end of 2014, which is re-prioritizing every ICAO Bureau, Regional Office, and of course our specialized GAT team on the needs of States when they seek to effectively implement ICAO Standards and Recommended Practices (SARPs). The availability of skilled personnel is critical to this initiative, both to the programme more generally and to the large majority of the safety, efficiency, security, economic development and environmental targets that have been established under it.

A more recent development I would bring to your attention regards the ICAO Council's decision to study ICAO's work in the areas of training and capacity-building during its 2015 Off-site Strategy Meeting. My colleagues and I, along with ICAO's senior Secretariat and GAT officials and a number of industry guests, looked at a range of critical training issues for aviation over the coming decades during this special two-day session. The report of our conclusions is being completed as of this writing and will very likely be the subject of a feature story in an upcoming issue of this report.

Earlier this year, ICAO concluded a special Africa-Indian Ocean Aviation Week event in Maputo, Mozambique, where human resources development was high on the agenda. This level of priority in Maputo reflects the fact that local and regional needs relating to training capacity and training results will be greatest in the coming years where aviation will also be growing substantially. This result was also seen quite clearly in the conclusions of recent ICAO studies in this area, as contained in our Doc 9956, the ICAO *Global and Regional 20-year Forecasts for Pilots, Maintenance Personnel and Air Traffic Controllers*.

With our sector set to double in capacity by 2030, there is simply no room for complacency where aviation's need for skilled personnel is concerned.

What Doc 9956 revealed is that only North America currently has a surplus of training capacity for pilots. Virtually every other region is faced with having only 25-50 per cent of the pilot training capacity they need. Virtually identical gaps can be seen where maintenance personnel training capacity is concerned, but in the ATC domain there is actually a deficit in North America and surplus capacity in both Africa and Latin America.

Admittedly, each of these personnel type domains poses unique sets of challenges in terms of training approaches, staff retention after the fact, etc. But from a more general standpoint what they each illustrate is that the aviation sector has a great deal to accomplish in the training domain, and in a relatively short period of time.

ICAO's Global Aviation Training (GAT) Office is helping ICAO to tackle these issues in a manner consistent with our global role, and the Harmonized Training Packages and other training management tools available with ICAO TRAINAIR PLUS membership are being very well-received by new and emerging training providers alike. We have also begun identifying Regional Training Centres of Excellence under TRAINAIR PLUS to serve as models for other training providers, and with due focus on the sharing of resources and related best practices where applicable.

Lastly, this fall ICAO will be hosting its very first high-level World Aviation Forum, where under the No Country Left Behind banner we will be bringing together States and partnering agencies from industry and the development community. The goal of this event, which is scheduled for 23-25 November at ICAO HQ in Montréal, will be to highlight business case development approaches that are most effective in securing both local budgets within States, as well as donor funding where available, to support the implementation of Standards and Recommended Practices (SARPS) and the realization by States of safe, secure and efficient air transport networks to the benefit of their citizens and businesses.

No modern business case in aviation is complete without a strong component highlighting all relevant training needs to properly accommodate any projected growth, and so we will be seeking to ensure that this special ICAO World Aviation Forum makes this very clear to the Ministers and Directors General of Civil Aviation we are expecting. They will be joined by a range of aviation leaders and specialists from international development banks and donor organizations in presenting the major issues concerned.

I would encourage all State training officials to bring this event to the attention of the most senior aviation officials. Our global network is always only as safe, secure and efficient as the people who operate and manage it, and dedicated support for training and human resources development will be key to how well we meet and surpass these objectives well into the future. ■

PREDICTING TEAM PERFORMANCE: THE IMPORTANCE OF SHARED COMPETENCIES

ABOUT LUANA DOS SANTOS BRITO

Since 2008, she has worked as a Civil Aviation Regulation Specialist at ANAC National Civil Aviation Agency in Brazil. For more than 6 years, she has been involved in training and staff development focussed on safety in aerodromes. Her job is to develop training regulations and verify compliance. As well, she works with the regulation of training for firefighters in aerodromes. To improve her work, she earned an MSc. in Social and Organizational Psychology at the University of Brasília/Brazil oriented towards understanding the operation of these teams.

ARE WORK TEAMS THE SOLUTION FOR MODERN ORGANIZATIONAL ISSUES?

Yes and no. Though in many business environments teamwork is the ideal arrangement, there are scenarios where individual work leads to better results. Ultimately, the choice between collective or individual work depends on the nature of the task. In the aviation world today, the increased use of workplace teams is widely recognized and there is a need for advancing studies in this field to understand team operations, and even more importantly, to improve their performance.

Before continuing further, the meaning of teamwork must be defined. In organizational psychology literature, "teams" are understood to be organizational units composed of at least three or more members; with interdependency of tasks, common objectives, shared information; and members are expected to act in a coordinated and cooperative way.

WHY CONDUCT RESEARCH ON THE COMPETENCE OF TEAMS?

We can find the answer by looking at a productivity scenario, and more specifically, at the work environment in an airport, where there are continuous demands for new workforce competencies that affect teams and their abilities to face challenges. Being able to adapt and develop the workforce becomes a competitive advantage within an organization.

All in all, the study of teams implies that we must understand the operation of collective attributes. This is the case for the demonstration of competencies: knowledge, skills and attitudes (KSAs). Two questions frequently arise in team studies: (1) can competencies be considered as collective attributes; and (2) what is the predictive power of team competencies in relation to job performance?

In an attempt to answer these questions, a study was developed where data was collected and analyzed on 1,196 firefighters at 51 Brazilian airports who were divided into 139 teams. This study was part of a Master's project under the guidance of Katia Puente-Palacios, PhD, at the University of Brasília/Brazil with the collaboration of the ANAC National Civil Aviation Agency in Brazil.

The study had three objectives:

1. to quantify the intensity of the relationship between the competence collectively mastered by members and the performance of work teams;

2. to investigate whether the sharing of competencies is associated with performance;
3. to demonstrate whether team performance is more often associated with the sharing of competencies than with the individual level of expertise.

These objectives were translated into research hypotheses, which were:

Hypothesis 1 (H1) the higher the mastery of competencies, the better the team performance;

Hypothesis 2 (H2) the greater the sharing of competencies, the better the team performance; and

Hypothesis 3 (H3) the sharing of competencies explains performance better than the individual level of expertise.

Analytical strategies for testing the hypotheses were applied at the team level, where it was necessary to obtain group scores. For this purpose, the average deviation from the median (ADmd) was used. Job performance was measured by both supervisor evaluation and response time (Figure 1).

WHAT WAS THE OUTCOME?

Research results showed high intra-group similarity and considerable inter-group differences, indicating that competencies are group phenomena. This first finding is very important to workforce management, most especially for firefighters at airports. Since they operate exclusively in teams, it is not possible for a single firefighter to successfully respond to an emergency. So they need a high level of coordination, fast response, and fast intra-group interaction in order to mobilize their competencies. In this context, one can say that these kinds of teams access collective competencies.

HOW CAN ORGANIZATIONS DEVELOP COLLECTIVE COMPETENCIES IN A TEAM?

We can identify some possibilities when focusing on training. Since firefighting teams need to be trained as a group and they spend their working time together, their supervisors can play an important role in developing collective competencies by improving the time they spend together. This time spent in teams is important because the mechanism that promotes the appearance of collective competencies is the foundation for how these professionals understand their roles. Ultimately, either they must have a similar way of looking at the world, or they have to share their insights.

We quantified the predictive power of collective competencies. The results demonstrated a total of 20% of prediction for performance on those teams that work with emergency response, as evaluated by the supervisor. This finding is quite notable and very expressive given that it indicates that a competent team is responsible for 20% of performance. For managers, this is important when instituting appropriate interventions to improve the conditions for raising collective competence in these teams.

It is important to note that the individual domain of staff competencies presented no evidence of a significant relationship with the performance of the teams participating in the study. This result shows that in emergency response teams, individual knowledge, skills, and attitudes have no influence on job performance in an isolated way, although when knowledge, skills, and attitudes are mobilized in a collective way, they do have an important influence on job performance.

The study revealed how shared competencies have a predictive power on the job performance of teams. This result can be of value in the field of organizational management, since it explains why training actions for developing individual competencies do not always have the expected impact on team performance.

Training actions must be performed using simulations with scenarios very similar to an emergency, and it is even more important that the teams that work together go through the simulations in the same groups. This is the most appropriate means for developing intra-group similarity (Figure 2).

Figure 1. Response time exercise in Brasília - Juscelino Kubitschek International Airport/Brazil

Figure 2. Airport firefighters performing exercises at Florianopólis - Hercílio Luz International Airport/Brazil.

Figure 3. Firefighting vehicles in Brasília - Juscelino Kubitschek International Airport/Brazil.

Figure 4. Airport firefighters after a simulation for an ANAC audit in Salvador – Dep. Luís Eduardo Magalhães International Airport/Brazil.

For Aviation Authorities, it is important to point out that the requirements for the Rescue and Fire Fighting Services (RFFS) need to incorporate more human factors to advance. Human capital is key in this activity. As an example, an airport can have the best equipment, the best fire station, the best communication and alerts system and the best firefighting vehicles (Figure 3), but if their firefighters are not well trained to operate the equipment, the emergency response service will not function properly.

Requirements for the volume, frequency and the competencies for recurrent training are decided by each ICAO Member State and one way to avoid undesirable variance in RFFS competence would be to encourage research in this field to improve regulation in each State.

Shared competencies in airport firefighter teams (Figure 4) can lead to improved performance. To achieve this desirable outcome, managers at airports and State regulators should:

1. give supervisors the opportunity to elevate the collective competencies in their teams;
2. promote collective training actions, mainly through doing simulations in teams; and
3. conduct the performance evaluation by team.

In conclusion, we must expand this field of study and we must invest in finding solutions to some of the limitations that are described here. For the purposes of this study, only teams that operate in Brazil were investigated (one limitation), and beyond that, no longitudinal data were observed. Therefore, the survey that was developed specifically for this study should be applied in many countries, in different time periods, and the data should be compared. ■

The study revealed how shared competencies have a predictive power on the job performance of teams.

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THE FUTURE OF TECHNOLOGY IN AVIATION TRAINING

ABOUT DR. SUZANNE KEARNS
Dr. Suzanne Kearns is an Associate Professor at the University of Western Ontario. She maintains an active research programme exploring competency-based training and the role of technology in teaching aviation professionals.

Physicist Niels Bohr once said, 'prediction is very difficult, especially if it's about the future'. Despite the difficulties, we can safely assume advances in technology will reshape the future training programmes of aviation professionals. This article will address four teaching technology trends.

Due to mandatory recurrent training cycles and the resulting escalating costs, the aviation industry has become an innovator and early adopter of training technologies. From the introduction and evolution of the flight simulator to being the first industry to widely adopt computer-based training, the aviation industry is quick to embrace technologies that may lead to enhancements.

#1 – HOW WILL THE NEXT GENERATION OF PROFESSIONALS LEARN?

Before exploring new technology, we must consider how future professionals will approach learning. Today's students are not the ones our training methods were designed to teach – because they grew up immersed in technology, they have different approaches to learning. While many experienced instructors assume that learners are the same as they always have been, and the same teaching methods that worked for us will work for them, the assumption is no longer valid. The next generation learns differently. They are:

- tech-savvy;
- multi-taskers, collaborative and team-oriented;
- 'native speakers' of technology;
- embracing simulation, interaction, and gaming;
- expecting immediate gratification; and
- demanding knowledge[1].

This is not a panic-worthy situation since there is evidence that young people seem to conform to the approach used by their instructors. But as we move towards the future, we must continue to assess the effectiveness of our teaching and ensure the curriculum is learner-focused.

#2 – WEARABLE TECHNOLOGY

Wearable technology refers to the portable devices that attach to the human body, collecting data and delivering information to the wearer. While these are new tools in aviation training, these devices are increasingly prolific given that there were nearly 109 million wearable devices around the globe in 2014[2]. Wearable devices have many of the same features as mobile phones but offer the enhancement of scanning features and sensors.

While many experienced instructors assume that learners are the same as they always have been, and the same teaching methods that worked for us will work for them, the assumption is no longer valid.

The data collected from them can be used in a range of applications:

- augmented reality helmets (like Google Glass) superimpose digital information over a person's view of the real world;
- wearable smart-clothing senses a variety of health data (respiration, heart rate, body temperature, etc.)[3]; and
- fitness wristbands track movement, calorie expenditure, sleep quality and quantity.

These types of technologies may impact aviation training since the effectiveness of instruction will always be linked to a learner's physiological state. For example: did these trainees get sufficient sleep; are they impaired by substances or medications; are they stressed or overwhelmed by information; or are they physically overworked?

Though skilled instructors develop the ability to recognize these issues in learners, wearable technology has the potential to track this type of data automatically and to objectively present instructional recommendations on how to tailor training material.

Some applications within aviation training may include:

- eye-tracking devices that sense stress levels associated with cognitive load – theoretically identifying when learners have achieved a level of competency with new material; and
- augmented reality systems that superimpose textbooks, media, or systems and components to:
  - replace air traffic controller's paper flight strips with a digital presentation of the information superimposed on their work space[4];
  - present maintenance personnel with a digital view of systems that may not be visible because they are obstructed by covers or other components[5];
  - display the name and preferences of passengers to cabin crew as they walk through the cabin; and
  - generate a digital representation of the ideal approach path for pilots.

Wearable technology also has limitations associated with costs and privacy, and is dependent on the willingness of the individuals who will be asked to use the devices. Google Glass is an example of a product that was rejected because people felt they 'looked goofy wearing them' and because they had a short battery life. Google recently discontinued Google Glass, going back to the drawing board to rethink their devices.

#3 – WHAT IS 'BIG DATA' AND HOW CAN IT DRIVE TEACHING?

Mobile devices play an important role in our personal and professional lives. Just as Hansel and Gretel left a trail of breadcrumbs as they walked down the forest path in the Brothers Grimm fairy tale, each of us is generating a stream of data that can be thought of as 'digital breadcrumbs'. As we move about throughout the day, we generate data points associated with where we were, who we spoke to, and anything we documented.

Beyond the data that is generated by individuals, massive amounts of data are created and recorded by machines. Google presents a good example of this in how they are able to detect disease outbreaks based on the number of illness-related web searches in a geographic area.

We have entered an era where data will be measured in zettabytes; society is generating an enormous and ever increasing amount of big data. To put this into context, if your extra-large cup of coffee represented the volume of one gigabyte, a single zettabyte would be equal to the Great Wall of

We have entered an era where data will be measured in zettabytes; society is generating an enormous and ever increasing amount of big data.

China![6] On a global scale, this has created a new industry that seeks to generate, analyze, and sell insights from the massive pool of big data using proprietary mathematical algorithms.

Although there are concerns associated with privacy and the accuracy of findings, applications of big data are already being used in aviation training:

- proactive safety management programmes use cluster analysis on routine operational data from Flight Data Recorders to identify anomalies at specific airports and assign training content;
- machine-driven learning algorithms that continually analyze data from simulated and line-operation scenarios to understand individual training needs and allow individuals to see and understand where their performance is relative to the norm[7]; and
- recruitment and selection practices based on the comparison of applicant attributes against competencies demonstrated by top-performing employees through predictive analytics.

In the future, big data is likely to impact the types of employees hired and the training they are provided throughout their careers. Although this leads to interesting training customizations, it is important to note that the quality of findings from big data is entirely reliant on the quality of information it receives. This is an exciting, but far from foolproof, innovation.

#4 – ADAPTIVE E-LEARNING

Beyond the use of big data to identify training needs within an organization, data can also be tapped into on an individual basis to drive the curriculum of training. Where traditional static e-learning targets the 50th percentile (the average learner), adaptive e-learning customizes the content to the learner based on their individual needs and abilities.

As technology evolves, new electronic courseware emerges. The training is designed to adapt to the needs and learning style of each individual learner so that they can achieve the highest level of learning possible, based on their unique intellectual capacity. Adaptive learning broadly refers to any educational computer programme that utilizes some type of artificial intelligence to guide the structure of the curriculum.

Interestingly, one of the first practical adaptive e-learning courses was developed within aviation. In the mid-1980s, F-15 avionics technicians presented a training challenge. Because they worked in their positions for a brief period, carrying out mostly routine tasks that were well supported by technology, their work did not allow for the opportunity to develop complex problem-solving skills. This left the Air Force with a problem – training assumed that test-station-repair troubleshooting would be learned on the job, but the job did not offer enough practice opportunities. A computer-based Air Force electronics practice tool called 'Sherlock'[8] was created as an environment where avionics technicians could practice troubleshooting skills - and it was extremely successful. Novice technicians who practiced on Sherlock for 20-25 hours developed troubleshooting skills comparable to their colleagues with four years of on-the-job experience.

Although adaptive e-learning offers great potential to improve learning, there are downsides. Development is significantly more expensive than traditional static e-learning, and it can't automatically sense when a learner is becoming frustrated or overwhelmed. But new research is incorporating emotion-sensing technology using computer webcams – so this may change in the future.

Since adaptive e-learning will likely, eventually, become a training component of training for all aviation professionals, this technology should be regarded as a complement and an

extension, rather than a replacement, of existing classroom, simulator and real-world teaching practices.

CONCLUSION

As new technologies are quickly integrated within our daily lives, new devices and methodologies will follow them into our training centres. But, it is crucial to remember that new technology does not necessarily result in more effective training. In considering the earliest days of computer-based training, many of the organizations that were first to deploy e-learning produced very low-quality ineffective courses because little was known at that time about how to make this type of training effective. To learn from the mistakes of the past and ensure they are not repeated, a cautious approach to the incorporation of future technology must be adopted. This will ensure technology effectively improves learning – before it is fully deployed. ■

SOURCE

This work will be featured in an upcoming book titled *Competency-based Training in Aviation*, co-authored by Kearns, Mavin, and Hodge, to be published by Ashgate in late 2015.

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AVIATION SECURITY TRAINING

ABOUT FRANK DURINCKX
Frank Durinckx has degrees in Law and Notariat (University of Louvain, 1978). In 1978, he joined the Legal Department of the Belgian CAA where he consecutively became Head of the Aviation Security Department and established the ICAO European Aviation Security Training Institute (EASTI). Over the past 30 years, he has participated in all AVSEC Working Groups under ICAO, ECAC and the EU. He was Director General of the Belgian CAA from August 2008 until December 2014, after which he joined ICAO as Aviation Security Project Coordinator.

Sophisticated security equipment and excellent aviation security requirements are not sufficient to assure efficient aviation security services. The human being continues to be the most important factor in the security process.

Although there is a general tendency to provide airports with the most sophisticated security equipment, the human factor is often neglected. By analysing reports on recent acts of unlawful interference, it becomes clear that aviation security is adversely affected by human factors.

The best security procedures and the most advanced security equipment become ineffective in cases of human error, human negligence or personnel inefficiencies. An efficient, well-trained and highly motivated security staff is considered to be a key element for the operational efficiency of any security system.

There is no doubt that a reduction in human errors and negligence would result in an improvement of the aviation security system, thus ensuring greater efficiency. Many groups of aviation personnel are directly or indirectly involved in the various aspects of security, from security officers to baggage handlers. Even minor errors by certain staff can result in critical situations with very serious implications.

A number of areas can be identified as possible sources of human factor weakness. These areas include recruitment, selection of personnel, training, commitment and motivation, supervision, fatigue and equipment. This article concentrates on the issue of training and examines the initiatives taken by international governmental organizations.

THE LEARNING PROCESS

A fundamental feature of learning is that it is acquired. How learning is acquired depends on three main factors: the innate qualities of the learner, the skills of the teacher, and the conditions in which learning takes place.

The development of innate qualities is beyond our control because it is part of biological development and maturation. A person's age, intelligence and attitudes, for example, are factors that cannot be changed by external influences. It is the role of the recruitment and selection process to select only those individuals who demonstrate the basic abilities to perform the required functions.

If these abilities are present, instruction, practice and experience all combine to develop the required level of performance. The effectiveness of the training will be dictated by the conditions under which this training takes place (e.g. amount of stress present, training methodologies, training aids utilized, etc.).

The best security procedures and the most advanced security equipment become ineffective in cases of human error, human negligence or personnel inefficiencies.

Training is any learning activity which is directed towards the acquisition of specific knowledge and skills for the purposes of an occupation or task. The focus of training is the job or task. For example, screening personnel are expected to be able to recognize and react to articles which could be used for acts of unlawful interference. Consequently, a sound knowledge of how to detect dangerous or restricted articles, weapons, explosive substances and other dangerous devices must be part of the fundamental knowledge of screening personnel.

A sound knowledge of the States' national security programme is needed to ensure that the screening staff reacts properly in a wide variety of situations. This training should include competency tests. A recognition of the importance of the task as the first line of defence is absolutely essential.

There is no best way of organizing training. What is important is that those who are carrying out the training are themselves prepared for, and committed to, achieving their task. Because of the vital contribution that training makes to the development of human resources and the achievement of an organization's aims and objectives, all those responsible for training, in any shape or form, also need to be trained for the task.

As well, because training is essentially a learning process, instructors must have an understanding of how individuals learn. In addition to a judicious selection of instructors, train-the-trainer courses are a must.

ICAO INITIATIVES

For training, Standards and Recommended Practices (SARPs) and guidance material are included in ICAO's Annex 17 - *Security*, as well as ICAO's Security Manual. The SARPs include the obligation to develop national aviation security training programmes.

ICAO has taken the initiative to develop worldwide Aviation Security Training Packages (ASTPs) aimed to assist Member States and the industry in developing and providing their own training programmes.

The following ICAO ASTPs have been developed:

1. **Basic Course** - aimed to guide the development of basic airport security personnel training to enforce, monitor and apply airport security preventive measures in accordance with locally approved programmes;
2. **Aviation Cargo and Mail Security Training** - aimed to train selected personnel involved in the handling of cargo, courier and express parcels, mail and company stores to apply security preventive measures in accordance with approved aviation security programmes;
3. **Aviation Security Crisis Management** - aimed to provide management personnel with the knowledge and skills needed to develop and implement sound crisis management procedures;
4. **Aviation Security Management** - aimed to train aviation security personnel at the managerial level to plan, coordinate and implement the application of airport security preventive measures in accordance with approved programmes;
5. **Aviation Security Instructors** - aimed to enable personnel to deliver specialized aviation security training courses to selected personnel utilizing validated material-dependent course material; and
6. **National Inspectors** - designed to provide aviation security personnel with theoretical and practical knowledge of audits and inspections as part of the National Quality Control System.

These ASTPs have been supplemented by theme-oriented ICAO workshops such as a National Civil Aviation Security Programme Workshop, a National Civil Aviation Security Quality Control Programme Workshop, a National Civil Aviation Security Training Programme Workshop and a Risk Management Workshop.

The ASTPs and workshops are being provided through ICAO's Aviation Security Training Centres (ASTCs), where they are adapted to the needs of the region they serve.

In 1989, ICAO established the Aviation Security (AVSEC) Mechanism which has fostered the establishment of training

There is no best way of organizing training. What is important is that those who are carrying out the training are themselves prepared for, and committed to, achieving their task.

facilities in this field of activity worldwide. All existing regional and sub-regional centres cooperate closely in order to achieve consistent results in an endeavour to promote increasingly higher standards in aviation security.

The objectives are to conduct aviation security training courses based on the ASTPs and workshops in the region. These centres also support regional aviation security training efforts. Courses are given by instructors made available by States and the industry, and are open to government officials and participants from the airport and airline industry.

New initiatives have been taken recently to introduce computer-based training (CBT) systems for the selection and training of detection equipment operators, and other security personnel, both on a worldwide basis as well as on a regional basis. As well, new efforts are being made to certify security personnel, including screeners, instructors and national inspectors which should provide assurance that these individuals meet all required international and national standards.

NEW ICAO POLICY

ICAO has the important task, not only to provide its Member States with the necessary regularly reviewed regulations and guidance material, but also to encourage all forms of cooperation between States in establishing and implementing their programmes.

The ICAO training policy in the field of aviation security has been reviewed and is being realigned through cooperative agreements between ICAO's Aviation Security and Facilitation (ASF) Section and the recently created Global Aviation Training (GAT) Office.

The TRAINAIR PLUS course development methodology is being applied to aviation security and the aforementioned courses will be made available through the TRAINAIR PLUS network of Regional Training Centres of Excellence (RTCEs) as well as the ASTC network, which is being enlarged.

Training is an essential keystone in any aviation security system and is, therefore, high on the agenda of ICAO's capacity-building programmes. As such, great emphasis will be placed on it within the ICAO Comprehensive Regional Implementation Plan for Aviation Security and Facilitation in Africa (AFI SECFAL) initiative, which is currently being launched and where ICAO aims to coordinate its efforts with all stakeholders. ■

COMMERCIAL AND GENERAL AVIATION: TWO SIDES OF THE SAME COIN

ABOUT MARK R. BAKER
He is a long time general aviation (GA) pilot and the President of the Aircraft Owners and Pilots Association (AOPA), the world's largest civil aviation organization. An enthusiastic advocate for GA, weekends find him enjoying the company of his fellow pilots at airports and seaplane bases around the country. In conjunction with his role as President and CEO of AOPA, he is Chairman of AOPA's Political Action Committee, Chief Executive Officer for the AOPA Foundation, President of the International Council of Aircraft Owners and Pilots Associations representing pilots in 72 countries, and Publisher of AOPA Pilot, the world's largest and most influential aviation publication.

While commercial aviation and general aviation can be thought of as two separate worlds, they are actually more like two sides of the same coin. You can't have one without the other.

General aviation (GA) is a rich training ground for a wide range of aviation careers – a GA pilot is a career in itself. GA flying is also a great way for commercial pilots to stay in touch with fundamental skills like aircraft control, decision-making and instrument interpretation.

THE SHIFT TO GA FOR PILOT TRAINING

In the United States, GA has become the primary training ground for airline pilots, eclipsing the military services as a source of new commercial pilots. And this trend is likely to continue. Military branches are training fewer people to fly manned aircraft and putting more resources into training drone operators – experience that, so far, hasn't translated into a career in civilian aviation.

It's important to recognize that more and more of the pilots we depend on to fly passengers and move cargo will get their training and build their flight hours in general aviation.

As the need to transport people and goods continues to grow, so will the need for more pilots. GA will play an important role in fulfilling this need by attracting more people into aviation and creating a flight training environment that's both effective and accessible.

The International Council of Aircraft Owner and Pilot Associations (IAOPA) affiliates around the globe have developed a range of programmes to address these issues, programmes that could serve many other countries well.

REACHING OUT TO THE NEXT GENERATION

We need to reach out to young people to spark their interest in aviation. This year the U.S. Aircraft Owner and Pilot Association (AOPA) is building a new Ambassador Programme, which includes elements that will help get youth excited about aviation and the many opportunities it offers.

Not only should teens know that there are promising career paths in the field of aviation, they should know that they have what it takes to follow these paths.

Aviation is accessible and exciting and it offers a wider variety of career opportunities than most people imagine. We want to be sure teenagers – the next generation of pilots – know how to get started.

In conjunction with the Ambassador Programme, we also offer AV8RS, a unique, free AOPA membership programme that is dedicated to teens. The programme gives them access to more information about flying and aviation; helps them get started with flight training; and helps them connect with other teens who are interested in flying. Bringing teens together in their medium – on social media and in virtual communities – is critical to getting them engaged in aviation. Creating online communities requires very few resources and serves as a platform that can be replicated almost anywhere.

Another way to engage teens in aviation is to bring the subject into the classroom. IAOPA affiliates do this by providing, free of charge, all the tools teachers need to explore aviation with their students. Available for download, PATH – the Parent and Teacher Handbook – provides classroom modules covering topics like communications, flight controls, aerodynamics, weather, aviation history and more. It also provides student worksheets, activity plans and classroom presentations that allow teachers to introduce their students to aviation.

AOPA is also partnering with youth organizations like the Boy Scouts of America to help them expand and update their aviation offerings.

UP AND AWAY

But what happens when these young people decide they're ready to learn to fly? What kind of experience can they expect when they walk into a flight school?

For decades, the answer has been open-ended. This inconsistency in training environments and experiences led to a dropout rate of

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up to 80 percent for student pilots – not because they didn't "have what it takes" to learn to fly, but because the training experience wasn't meeting their needs.

To bridge the gap between student expectations and what flight schools deliver, many IAOPA affiliates are working directly with flight schools to help them get more students through the training process. AOPA conducted thorough research into the reasons so many student pilots were not completing their training and then worked closely with flight training providers to identify the most effective ways to overcome these obstacles.

We've shared this information about best practices in flight training throughout the industry. We've also expanded our efforts to create a forum where flight schools can share their own experiences, collaborate to resolve stubborn challenges, and build on their successes. By publicly recognizing the most successful schools, and encouraging them to act as mentors for others, we've helped create a community that's raising the standards of service and training while helping more students earn their pilot certificates.

Introducing young people to aviation and improving training completion rates are key ways the general aviation community can promote aviation and ensure there will be enough pilots to meet our future transportation needs. But there's another role GA can play, and that is as a continuing training ground for those who already have aviation careers.

BRINGING FLYING BACK TO FLIGHT

Many of today's professional pilots are actually only flying the plane for two to three minutes out of each flight. They are often discouraged by their employers and regulators from spending more time flying by hand and are required to let the sophisticated automation in the aircraft handle most of the work. As a result, we've seen a notable increase in accidents where commercial pilots have lost situational awareness or didn't know how to respond in an emergency.

The cure for what's sometimes called "automation addiction" is consistent training and practice in how to fly the airplane. GA flying, where instrumentation and controls are comparatively simple and automation is minimal or nonexistent, is the perfect way for pilots to keep their skills sharp.

From takeoff to landing and at every step in between, pilots of light GA aircraft must control the airplane, interpret the instruments, and make decisions using the skills that are most essential to flying. These aircraft are economical and fun to fly, making them a decisive means for pilots to ensure their skills are up to the mark and to keep them in touch with the reasons most of them started flying in the first place.

General aviation has an important role to play in our global aviation system. We need GA to produce new pilots and keep the current ones sharp while providing everything from agricultural to humanitarian services. But we also need regulatory environments that support GA and its unique place in our transportation network. By working together, and recognizing that commercial and general aviation are two sides of the same coin, we can help grow the pilot population, improve safety, and expand horizons for, not only those who fly, but for everyone who benefits from a safe and effective transportation network. ■

YOUR PEOPLE + QUALITY TRAINING = GOOD BUSINESS SENSE!

Part I – The evaluation of training

ABOUT KEVIN CARON
Kevin Caron joined ACI in March 2010 and currently holds the position of Head, Global Training and Developing Nations Airport (DNA) Assistance Programme. In addition, he serves on the ACI-ICAO Airport Management Professional Accreditation Programme (AMPAP) Steering Committee as ACI Team Leader. Prior to ACI, Kevin spent eight years with the Montreal Airports Authority (Aéroports de Montréal) before joining IATA in 2003, where he held two training management positions in security and airports.

It's critical for us as human resources (HR) and training professionals to measure the effectiveness of our Learning and Development (L&D) programmes in relation to the organization's performance—be it an airport, airline or Civil Aviation Authority. In this article (Part I), I will review how we can evaluate our L&D programmes, and in the next edition of ICAO's Training Report, I will outline a way of measuring the return on investment (ROI) of our training programmes.

It's widely accepted that one of the first L&D measurement methods was created by Don Kirkpatrick, who wrote his PhD dissertation on the four-level model for course evaluation, a widely used tool across numerous industries.

The four levels created by Kirkpatrick are designed to be a structured way of evaluating training programmes. Many training practitioners believe that as you proceed through each of the levels, the evaluation becomes more difficult and requires more time.

Today, many begin with Level 4 and move backward in order to better establish the desired outcome before ever planning the training programme. When done strategically, reaching each subsequent level does not need to be more time-consuming than reaching the previous. Nonetheless, following Kirkpatrick's established structure will help to ensure on-the-job performance of learned behaviors and skills.

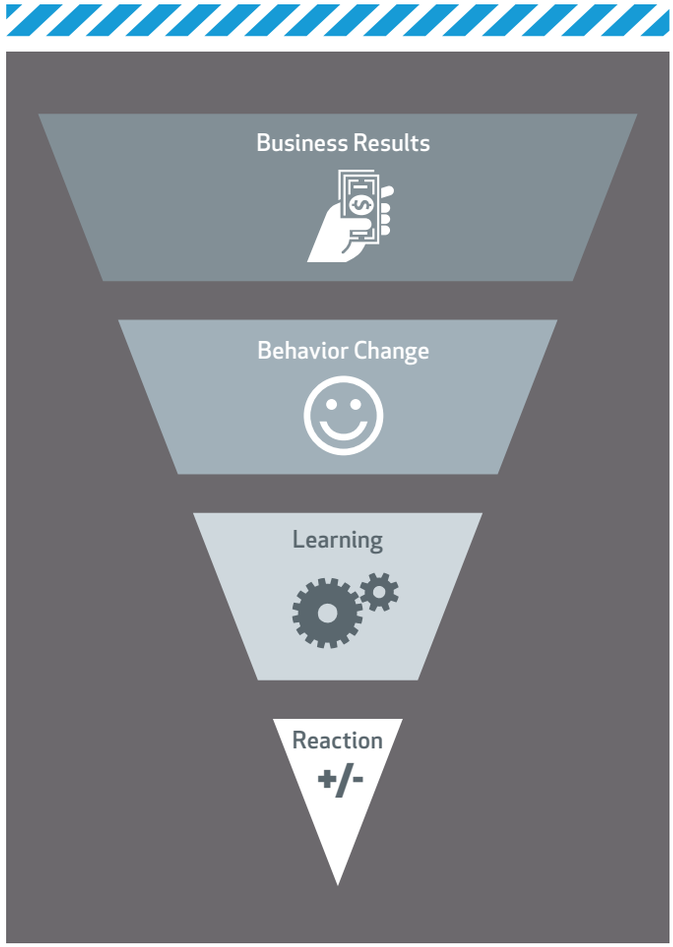
The four levels created by Kirkpatrick are designed to be a structured way of evaluating training programmes.

The four levels of Kirkpatrick's evaluation model are as follows:

1. **Reaction** refers to the degree to which participants reacted favorably to the training. Simply put, did they enjoy the course? Was it worth their time?
2. **Learning** relates to the degree to which participants acquired the intended knowledge, skills, attitudes, confidence and commitment based on their participation in a training event. This evaluation occurs during the training in the form of either a knowledge demonstration via exercises or tests.
3. **Behavior** refers to the degree to which participants apply what they learned during training when they are back on the job (e.g., an increased safety culture).
4. **Results** indicate to what degree targeted outcomes occur as a result of the training event and subsequent reinforcement. For example, after a revenue management course, was a more articulated airport commercial plan developed or was there an improvement in the quality of services offered to customers?

Many authors in this field suggest that a fifth level be added that examines the ROI (i.e., the costs of the training versus the outcomes). This last level is an important tool that allows us to indicate that the training programme has made an impact on the organization (e.g., a more motivated workforce).

This fifth element will be explained in my next article given the importance of ensuring that our training efforts are being linked to organizational targets. Indeed, as HR and training professionals, we should always ensure that our programmes are adding value. ■



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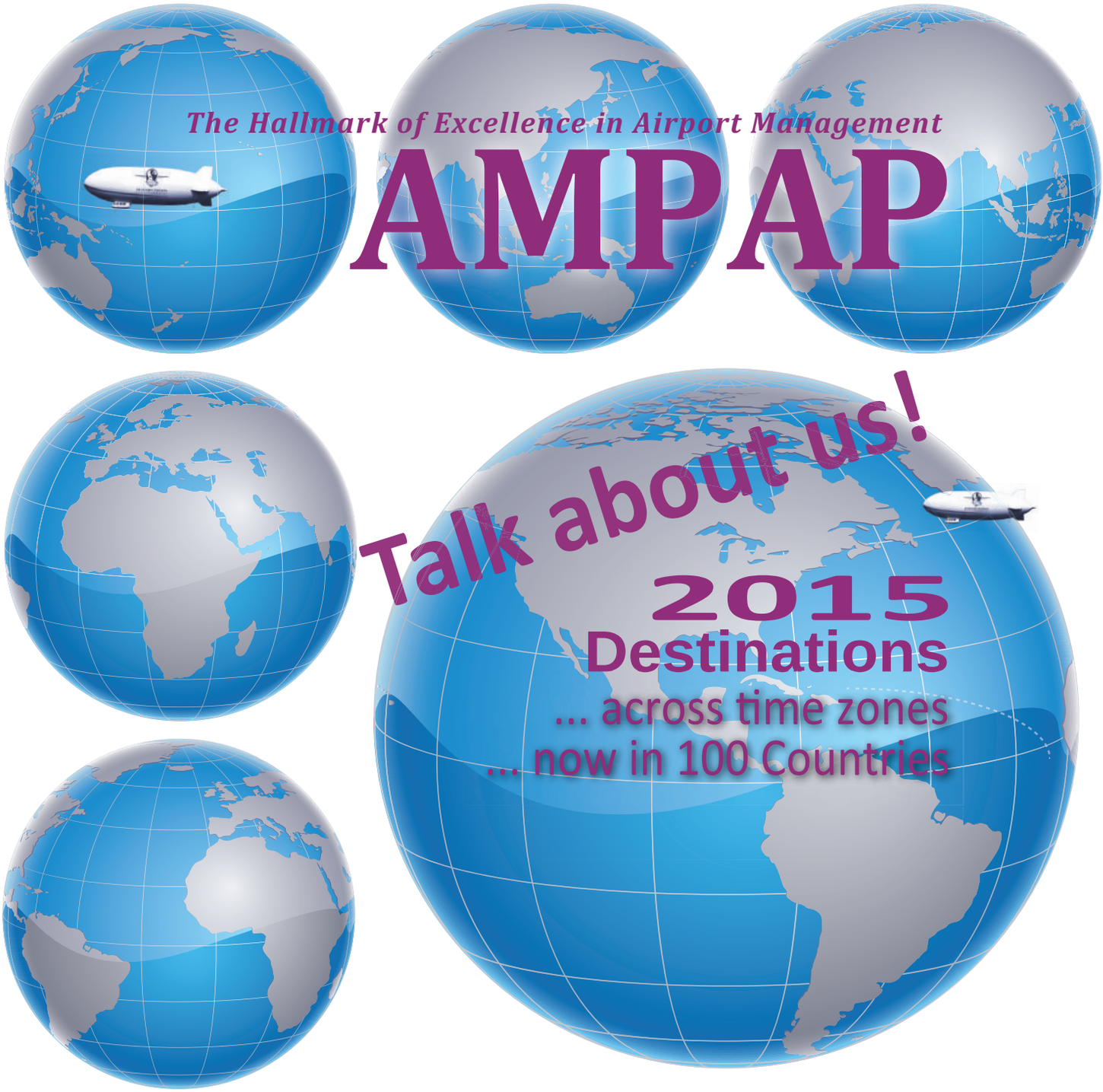

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AVIATION STRATEGIES INTERNATIONAL

THE IMMINENT WORKFORCE SHORTAGE: AN OPPORTUNITY FOR FURTHER STANDARDIZATION AND PARTNERSHIP

ABOUT VICTOR DE BARRENA-SAROBE

With over 25 years in the aviation industry, Victor de Barrena-Sarobe rejoined IATA in January to lead the ITDI team worldwide. Victor has worked in the training and HR areas for the last 11 years of his career, leading teams to emphasize and prioritize the importance of training and L/D in international organizations. Victor is originally from Spain and is currently based in Geneva, Switzerland.

By 2032, the commercial aviation workforce is expected to be almost double what it is today[i]. The aviation industry has been hit with both financial instability and large scale retirements, and many aviation businesses are struggling to attract and retain qualified staff.

Although the situation is a looming concern for the industry, we have had advance warning. A number of industry analysts, IATA experts included, have predicted a sharp increase in air traffic demand, and it is no secret that the ageing baby boomer generation is nearing retirement.

SO WHY HAVE WE YET TO SEE ANY CONCERTED ACTION FROM THE INDUSTRY?

This is not a simple problem and there is no simple solution. As projections become a reality, we need to act. The industry has begun to address workforce issues in dribs and drabs, but it is unclear how this will deliver long-term results.

While efforts have been primarily focused on the most visible aviation professions – pilots, mechanics, air traffic controllers – these are only a fraction of the diverse jobs that the industry supports. As the demand for air traffic grows, so too will the companies that support the commercial aviation infrastructure.

Training and development are additional investments for businesses and, beyond the financial investment, they call for added resources, time and effort. Like it or not, specialized training is a necessity in our industry, to not only maintain our stringent operating standards, but also to expand our businesses and produce results.

Expecting that each business, region and industry sector will develop its own internal training and development solutions is unrealistic. Cooperation on various industry issues, such as the future of the workforce, is needed.

In March, I had the opportunity to participate in discussions with industry leaders on the topic of challenges for aviation training and development at the ICAO TRAINAIR PLUS Global Symposium. We explored the areas we need to address as an industry to resolve both current and longer term training and development issues.

Together with key stakeholders from ICAO, Airports Council International (ACI), Eurocontrol and Entry Point North, we discussed the challenges that are preventing aviation training from reaching its full potential. Our challenges in training are being addressed; however, we cannot lose sight of focusing on how we train, where the new talent comes from, and how we will retain it.

To this end, the TRAINAIR PLUS model is being implemented with great success. Within this model, TRAINAIR PLUS members develop course materials known as Standardized Training Packages (STPs), which are then validated by ICAO and made accessible to all members. This is one important step toward consistency because the global recognition of standardized training will certainly benefit the industry. Our colleagues are reporting that the advances made in this key area will turn our challenges into opportunities in the future.

CHALLENGING OUR APPROACH TO TRAINING AND DEVELOPMENT

1. How we train

As aviation businesses grow, they will need to allocate sufficient resources to train the influx of staff. Frequent and recurrent training is a requirement for many professions in our industry and it further increases the strain on businesses. For this reason, we must streamline our training to make it effective, timely and affordable for businesses.

Our challenges in training are being addressed; however, we cannot lose sight of focusing on how we train, where the new talent comes from, and how we will retain it.

Changing skill requirements and new delivery methods makes it challenging for trainers to keep up with demand. Rapid technological changes, shifting corporate priorities and high turnover rates make it difficult to adequately prepare and deliver training materials by the time employees need the information and skills. Moreover, training has to be carried out in ways that are globally consistent.

As internal and external training providers, we need to be able to provide relevant training when it is needed. We need to be able to quantify the effectiveness of our training, because what participants learn and how they use this newly-acquired knowledge must be aligned with job performance requirements.

Our ability to integrate new technology in our training methods to ensure that we meet growing needs is critical. We should be taking advantage of the world's 1.8 billion social media users and the staggering number of mobile device owners across the globe.

It is also time to define the competencies, skills, and professional needs in aviation outside of pilots, technicians, and air navigation services. Professional standards, in the form of professional designations, are an obvious solution. ICAO and the International Air Transport Association (IATA) have partnered in the definition of professional designations through the ICAO-IATA joint I-Train programme.

We also see success in ICAO's partnerships with ACI and the Airport Management Professional Accreditation Programme (AMPAP). Air Navigation Service providers are further

partnering with global experts such as IATA to create training packages, transforming them into professional designations.

The final piece of the puzzle will involve stronger lobbying to governments, regulators and industry groups to ensure the acceptance and implementation of these professional designations as the expected global standard for aviation.

2. Attracting new talent
Staffing, in general, will be an issue for many growing businesses. Filling positions will require a creative approach to attracting new and young talent. For many of us in aviation, interest in the industry began at a young age. Most would agree that a young person's awareness of available aviation careers is often focused on the most visible, and seemingly glamorous, jobs. It is our responsibility to shine a light on the many lesser-known job opportunities as well.

Unlike the handful of certified aviation professions, there are few set paths for many of the other career opportunities available in the industry. Many jobs, particularly entry-level jobs in fields such as baggage handling, customer service and ramp handling, have a high turnover rate and offer little opportunity for career development.

The situation is not much different for management-level positions. University programmes most often target professions such as human resources, management and accounting, which are common to a variety of fields. While programmes like these can lead to employment in the aviation sector, what competitive benefits do we offer young graduates who may be considering other industries as well?

A global common standard is key to ensuring we attract talent that is mobile, flexible and with a clear professional future.

The path to follow, as mentioned before, involves a clear set of professional entry points so that newcomers to aviation can plan, choose and implement their own professional growth. A global common standard is key to ensuring we attract talent that is mobile, flexible and with a clear professional future.

3. Retaining talent
Aviation employers are just one group among many in a competitive, international market. Competing for the best talent and professionals on a global scale becomes more challenging when we consider developing regions. Businesses there compete with higher growth and higher pay in neighboring countries and often lose many experienced workers to them.

OPPORTUNITIES FOR PARTNERSHIP

While the industry's workforce problems and solutions may be multifaceted, we are making progress by working together. Today, we are seeing a number of partnership and collaboration opportunities that did not exist until a few years ago.

Moving forward, we need to balance long-term business strategies with the short-term financial results we too often seek. Thanks to ICAO's leadership in providing distribution platforms, partnership opportunities and the enhancement of existing frameworks, we see our industry is successfully putting differences and competition aside in order to develop sustainable solutions for the industry as a whole. This is encouraging and a very good start indeed. ■

[1] *Aviation Benefits Beyond Borders*. 1st ed. Oxford Economics, 2014. Web. 31 Mar. 2015.

Singapore's representatives at the ICAO NGAP Symposium and Model Council Session, Kong You Sheng and Xingjie Yeo, outside the ICAO Headquarters in Montreal.

IGNITING THE PASSION FOR AVIATION

ABOUT KONG YOU SHENG
You Sheng is a graduating student of the National University of Singapore (NUS) with a Bachelor of Engineering (Mechanical Engineering). He has been offered a position as a Probationary Air Traffic Control Officer (PATCO) with the Civil Aviation Authority of Singapore (CAAS). Training will last up to one year.

As part of their ongoing initiatives to promote aviation to youth, the Civil Aviation Authority of Singapore (CAAS) organized a contest for post-secondary students in Singapore. From the entries submitted, two students were selected to attend the International Civil Aviation Organization (ICAO) Next Generation of Aviation Professionals (NGAP) Symposium held in Montreal in December 2014, and to represent Singapore at the ICAO Model Council Session that followed it. Kong You Sheng, an undergraduate in the National University of Singapore's Faculty of Engineering, shares his experience.

I was thrilled to learn that I was one of two students chosen to represent Singapore at the ICAO Model Council Session that was taking place in Montreal. Our week-long visit was part of a unique programme that was organized and sponsored by the CAAS where we would experience first-hand how ICAO Council Sessions are run. We spent the month before the trip preparing our papers for the ICAO Model Council Session, meeting other participants virtually, and preparing ourselves by researching global aviation issues.

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LEARNING VISITS

The Province of Quebec, where Montreal is located, is home to one of the world's leading aerospace centres, so we appreciated that the first part of our programme included site visits where we were introduced to Montreal's aviation industry. We enjoyed a private tour of Bombardier's Global Completion Centre where we saw how new private jets arriving in Montreal are fitted to their customers' exact specifications. The process starts with customers selecting the design and materials used to furnish their jets and finishes with the actual assembling of them. It was truly impressive to witness the degree of customization possible and the systematic assembly line.

Next, we visited l'École nationale d'aérotechnique (ENA), which offers training for aircraft maintenance technology, aircraft manufacturing technology and avionics technology. I was able to get up close to the 300 aircraft in the school where students are trained to become licensed aircraft engineers. We also saw a real aircraft built by ENA's students, which they could use for a weekend getaway flight!

We were warmly hosted by the Permanent Mission of Singapore to ICAO. Mr. Ng Tee Chiou, Permanent Representative of Singapore on the Council of ICAO, and Mr. Mervyn Fernando, Air Navigation Commissioner of ICAO, showed us around ICAO Headquarters and shared valuable advice that helped us prepare for the ICAO Model Council Session. We even had the chance to visit the Air Navigation Council Chamber, the very place where important global decisions on air navigation services issues are made!

GLOBAL PERSPECTIVES ON ATTRACTING AND RETAINING NGAPS

The highlight of the trip was the two days we attended the 2nd ICAO NGAP Symposium, a forum for aviation professionals to share the best practices in attracting, developing and retaining NGAPs in aviation.

The Symposium underlined the critical need for an adequate supply of competent and professional manpower to manage and maintain future international air transport systems. To that end, we learned of practical solutions that could be implemented globally to increase interest in aviation among youth. This included showcasing aviation applications in science and technology subjects, and travelling aviation exhibitions.

We had the opportunity to hear from inspirational figures such as Ms. Julie Payette, Canada's first female astronaut. Mr. Daniel Ng from the Civil Aviation Authority of Singapore (CAAS) also shared Singapore's experience in developing Singapore's aviation manpower, and I learned of the many programmes available to youth in Singapore to help them get a head start in their aviation careers.

With Mr. Ng Tee Chiou, Representative of Singapore on the Council of ICAO

Kong You Sheng with new friends from the ICAO Model Council Session

We spent the remainder of our trip participating in the ICAO Model Council Session, where representatives from Council Member States role-play as ICAO Council Representatives, researching a working paper and problem solving with the other representatives while in session. During the Session, representatives from Australia, Nigeria and the United Kingdom presented their working papers on "Challenges Relating to the Projected Shortages of Skilled Aviation Personnel". Their proposals included the expansion of ICAO's Young Aviation Professionals (YAPP) Programme; the formation of an international youth aviation network; and solutions that would attract more women to aviation. Eager to join in the discussion, I made some suggestions on activities for the international youth network and ways to improve aviation jobs that might draw more women into the field.

The ICAO Model Council Session provided us with an opportunity to meet other students and NGAPs from all over the world who are as passionate about aviation as we are. I hope we will have the chance to engage with them in future. I also look forward to the implementation of the International Youth Aviation Network, as I would be keen to be a part of the global movement to introduce youth to the exciting world of aviation.

TIME FOR PLAY

Of course, it wasn't all work with no play. We had the opportunity to visit Montreal's sights including the Notre Dame Basilica, the historic Old Port and Mont Royal. It snowed for a few days while we were there, the first time I had experienced snow. Montreal is a city rich in history and culture and I would love to visit again.

I thank CAAS for this exceptional opportunity. The experience has deepened my interest in aviation, and when I graduate this year, I look forward to shaping the next phase of Singapore aviation.

The programme is part of CAAS' Youth Outreach initiatives. Through aviation activities ranging from open houses to educational workshops and youth ambassador programmes, CAAS aims to develop a passion for aviation in Singapore's youth. ■

CIVIL AVIATION AUTHORITY OF SINGAPORE - AVIATION OUTREACH PROGRAMMES

Aviation Learning Journeys
Aviation Learning Journeys bring students out of the classroom to experience first-hand, either life in an aviation company or an aviation course in an Institute of Higher Learning. Students learn about the history and role of aviation in Singapore's development and the diverse range of aviation careers available.

Aviation Open House
Held every two years, the Aviation Open House provides a platform for students to learn more about aviation education and career opportunities. Exhibitors at the Aviation Open House include companies from the aerospace, airline, airport and air navigation services sectors, as well as Institutes of Higher Learning.

Aviation Lesson Toolkits
Aviation Lesson Toolkits provide lesson plans that infuse aviation themes with subjects like science, economics, social studies and design & technology for secondary schools and junior colleges to use. Teachers can use these toolkits to expose students to aviation and enhance their learning experience with real world applications of school subjects.

Air Scouts
CAAS has partnered with the Singapore Scout Association to build passion for aviation in students through the Air Scouts units in schools and a two-day Young Aviators Badge (YAB) programme.

Aviation in Schools Initiative
The Aviation in Schools Initiative (ASI) seeks to foster schools where students are fully exposed to an aviation environment, to entrench interest in aviation and its careers. The ASI provides comprehensive funding and advisory support for schools wishing to cultivate or develop aviation as a niche area.

A NEW TRAINING CENTRE IN PORTUGAL: A UNIQUE PROJECT TO BOOST THE NEXT GENERATION OF AVIATION PROFESSIONALS

ABOUT MIGUEL MOREIRA
He holds a PhD in Astrophysics, and a MSc. and BSc. in Theoretical Physics from the University of Lisbon. He also holds an advanced study diploma in Air Transport Operations, and has 11 years of experience in developing and implementing aviation related higher education curricula in Portugal. For ten years he was the Director of the Safety, Technologies and Aviation School of ISEC- Instituto Superior de Educação e Ciências, a polytechnic institute in Lisbon. During this period, he integrated an international pool of experts for HETAC – Higher Education and Training Award Council (Ireland). He holds a PPL(A) since 2008, and since 2013 joined the G Air Training Center as the Director of Programmes, Studies and Research.

As our flag carrier TAP Portugal celebrates its 70th birthday and the country slowly recovers from its debt crisis, the Portuguese aviation community faces the challenges imposed by the privatizations of TAP, and ANA – Aeroportos de Portugal (now owned by Vinci Airports).

The country is attracting significant attention in terms of international tourism and, in the face of future demand, we need to adapt to the fast-growing global air transport industry.

With regard to training, this means that Portuguese organizations need to further develop and consolidate their networking capabilities, and improve their training methods in order to meet increasingly demanding international standards, and to remain competitive.

G AIR TRAINING CENTRE: A UNIQUE PROJECT IN PORTUGAL

Founded in 1979 under the name EAA - Escola de Aviação Aerocondor, and operating in Cascais (LPCS) near Lisbon, the training centre has trained thousands of commercial and airline pilots and other flight personnel who now serve in major airline companies worldwide. EAA is a European certified ATO under EASA regulations.

In 2005, EAA was bought by the Gestair Group, a Spanish consortium that includes a commercial airline, cargo, maintenance and private jet operations. This transition further solidified EAA as an international pilot training company, because the Gestair Flying Academy operated from 3 bases: Madrid (Spain), Cascais (Portugal), and Santiago (Chile).

During this period, EAA created additional bases in Bergamo and Sardinia (Italy), and initiated a long term collaboration with Emirates Aviation College in Dubai through a partnership with the Jeppesen Academy.

With the implementation of ICAO's requirements concerning the English language proficiency of airline pilots, EAA became the first Centre of Aviation English in Portugal, certified by the Mayflower College (UK), which rated most airline pilots from TAP, SATA (Azores), and Portugália Airlines.

The G Air Training Center in Cascais, Portugal

With a strong passion for helping to develop a new generation of aviation professionals, EAA became an IATA Authorized Training Centre in 2011, offering aviation training opportunities to those pursuing an aviation career in an international environment.

In 2013, EAA became the G Air Training Center, part of the G Air Group and entirely owned by a Portuguese shareholder. In May 2014 the group acquired the Madrid school from the Gestair consortium.

G Air is currently expanding its activities in brand new, purpose-built, best-in-class facilities in the Ponte de Sor Aerodrome (LPSO), a €50 million investment towards the launch of a unique aviation centre in Portugal.

Located some 120 km NE of Lisbon, the new training centre is dedicated to developing careers in the air transport industry, offering a complete spectrum of training courses, from pilots and maintenance technicians to airline and airport managers, in addition to integrated aviation services solutions, from type ratings to maintenance, handling, and private jets.

PARTNERSHIPS WITH UNIVERSITIES

G Air's vision to be at the forefront of the industry's most dynamic and innovative abinitio training programmes led to strong partnerships with several Portuguese and European universities in order to create and offer Aviation Bachelor and Masters Degree Programmes. These are the only degree programmes in Portugal that are fully dedicated to aviation.

G Air now offers student pilots the possibility to combine the ATPL course with higher education degrees in Pilot Studies, Aircraft Systems, or Aviation Management across Europe, through partner universities such as the Institute of Technology Carlow (Ireland), Bucks New University (UK), Embry-Riddle Aeronautical University Europe (Germany), and Portugal's ISEC – Instituto Superior de Educação e Ciências and Universidade Lusófona.

To widen its programme implementation in Europe, G Air has continued to strengthen international collaborations with distinguished institutions such as Universidad Europea de Madrid and the Universidad Politécnica de Madrid to provide a comprehensive range of aviation-focused programmes and to further its goal to become a centre of excellence for aviation knowledge and human capital development

To consolidate this academic network, G Air joined forces with the municipality of Ponte de Sor and is creating a University Campus within the Ponte de Sor Aerodrome, offering classrooms and labs, as well as lodging (a total of 166 double bedrooms) to accommodate up to 300 students full-time. Students from the partner universities will be able to combine training and education programmes in a single location to get a competitive edge, as they gain in-depth knowledge of technical matters and a holistic understanding of the air transport industry.

We must also involve youngsters in aviation-related experiences, including learning activities from an early age.

This far-reaching project, aims to develop careers in aviation, by empowering future pilots and other professionals with academic skills that drive their career perspective significantly beyond the usual training path. It is fully aligned with ICAO 's NGAP initiative, to ensure that enough qualified and competent aviation professionals are available to operate, manage and maintain the future international air transport system through close collaboration between training centres and universities.

Students of the aircraft mechanics vocational programme.

The G Air Training Center 's main building in Ponte de Sor (LPSO).

INTRODUCING HIGH-SCHOOL STUDENTS TO AVIATION JOB EXPERIENCES THROUGH ACCREDITED COURSES

In order to attract young people to the aviation community, we need to intensify outreach initiatives so that different aviation activities and professions become well known among the public. In addition to thinking globally, we must act locally.

However, outreach and public awareness of aviation professions alone is not enough. We must also involve youngsters in aviation-related experiences, including learning activities from an early age. With this in mind, G Air has developed the first two-year vocational programme in the State for high-school students that involves them in practical activities in the field of aircraft mechanics and maintenance. Of the 23 existing vocational courses in Portugal, this new course is the only one dedicated to aviation thus far.

Subsequent to becoming an EASA Part145 organization, the centre initiated the vocational programme in October 2014 with 20 young students (aged 15 to 17) who will spend two years learning aircraft systems along with a 525 hour on-the-job internship with G Air. This course is an alternative to the standard high-school curriculum, with the significant advantage that the students will graduate having earned real on-the-job experience in aviation. This experience should fuel the students' interest in aviation careers, and hopefully, many other high-school students will follow this path.

LEADING PILOT TRAINING IN AFRICAN PORTUGUESE-SPEAKING STATES

The G Air methodology, which focuses on training professional airline pilots according to airline philosophy and standard operating procedures, has prompted several African partners to invite the centre to help develop new programmes for their States.

Specifically, G Air is now involved with the development of new aviation training and degree programmes in Angola, Cape Verde and Mozambique. G Air is already accredited by the Angolan National Aviation Authority to provide pilot training, and very soon other African CAAs will follow.

This will allow G Air to contribute significantly to the African effort to meet the present and future demand for qualified personnel. As well, the centre is also approved by the Brazilian Authority as the only English test centre outside Brazil that is permitted to deliver the Santos Dumont English Assessment, which must be taken by all Brazilian pilots.

These and other projects are helping to pave the way towards Portugal's future as a true force in global aviation training and education. ■

TRAINING FOR ANIMAL HAZARDS

ABOUT LAURIE DONOT
She studied at the Reims Faculty of Sciences and earned a Masters in Environment and Wildlife Management in 2014. Following her research into the impact of land fragmentation and the study of sea turtles in the Antilles, she became involved in integrating Animal Hazards Management within the Centre Français de Formation des Pompiers d'Aéroport (C2FPA) where she develops measures to meet regulations on evaluation and mitigation of wildlife risks.

In 2014, the Civil Aviation Services in France recorded 500 incidents involving aircraft and wildlife. Birds are the main threat, but other animals are also a potential aircraft safety hazard. About 9 per cent of these strikes are classified as "serious incidents" which delay air traffic and can cause significant damage to an aircraft's airframe and jet engines.

The aircraft's jet engines are affected in 40 per cent of actual strikes and, depending on the aircraft, the estimated cost of a jet engine could amount to as much as one third of the price of the aircraft.

In addition to causing physical damage, wildlife strikes also jeopardize passenger safety. Such damage can be very costly (up to several million euros) to airline companies, which may sue the airport operator.

Since 90 per cent of recorded strikes occur near an airport, for safety and potential liability considerations, the airport operator is obligated to guarantee flight safety to the greatest extent possible.

Wildlife strikes occur most often when an aircraft is taking off or landing. Take-offs are the critical phase when most strikes occur and they are characterized by twice as many serious incidents.

Since 90 per cent of recorded strikes occur near an airport, for safety and potential liability considerations, the airport operator is obligated to guarantee flight safety to the greatest extent possible.

For this reason, 140 airports in France now have a Wildlife Hazard Prevention (WHP) Unit. These units contribute to flight safety and reduce the likelihood of collision between aircraft and wildlife during take-off and landing operations by taking steps to scare off species that are air-traffic hazards, by means of visual, auditory or pyrotechnic methods or removal.

In the majority of airports, wildlife control and related tasks are performed by the staff of aircraft rescue and fire-fighting units (ARFF).

The responsibilities of wildlife control officers involve major challenges that require precise and advanced wildlife hazard prevention knowledge and skills, whether in terms of the environment, the wildlife or the dispersal action. Wildlife hazard prevention is governed by strict regulations and calls for qualified and competent staff.

In acquiring the qualifications and skills required to perform their duties at airports, all wildlife control officers must undergo **WHP Induction Training**, which is provided by the French Airport Fire-Fighter Training Centre (C2FPA).

C2FPA, a leader in the twin specializations of training airport fire-fighters and wildlife controllers, offers more than ten qualifying training courses on Wildlife Hazard Prevention at airports.

TRAINING GOALS

The overarching goals of induction training provide new wildlife hazard prevention staff with the necessary knowledge and technical skills to train them to meet the following challenges:

- flight and passenger safety when taking action;
- effectiveness of action taken;
- speed in taking wildlife control action; and
- optimization of intervention costs.

The goal of training is to optimize officers' operational performance and meet the needs of customers (namely passengers and airline companies). The training course incorporates:

- theoretical and methodological inputs;
- individual and collective practical exercises;
- case studies;
- provision of examples and illustrations;
- situational practice (in the classroom and at the airport, if possible); and
- feedback discussions on wildlife hazard prevention officers' experiences.

Optimization of officers' operational performance also involves optimization of the costs for implementing a customized deterrence. Pyrotechnics are often the costliest WHP method (in terms of consumables), particularly at airports outside metropolitan France where the estimated cost of a

long-range detonating flare is about €40. Costs incurred in WHP can be better optimized by raising officer awareness and by exerting great control over their activities.

For deterrence methods to be effective, species, location, movements, ethology and environmental conditions (wind direction, visibility, etc.), are factors that must be considered. They determine which control method or approaches are preferred; which safety instructions must be put into practice; and whether an intervention technique is effective. After completing the training course, WHP officers should be efficient in hazard prevention and should have acquired the sound knowledge and skills required to independently take decisions on the airfield.

THE TRAINING PROGRAMME

C2FPA, the first training centre to be approved by the Civil Aviation Directorate-General and to be certified under ICAO's TRAINAIR PLUS Programme, complies with international standards and recommendations in designing the content of all training courses, which are based on technical training benchmarks. The benchmarks are adapted regularly and are validated systematically under a formal procedure involving an internal reading committee, the C2FPA educational committee, the C2FPA general educational officer and the French Civil Aviation Director-General.

The three-day wildlife hazard prevention induction training course is provided in C2FPA premises at Châteauroux and covers both theory and practice.

The theoretical modules consist of lessons on:

- regulations (national, European and international regulations on rights and responsibilities in particular);
- general aeronautics (aircraft vulnerability, critical airport zones);
- faunistics (recognition, ethology and protection status of wildlife found at and near airports) and the environment (attractive areas and solutions);
- wildlife control methods used (deterrent methods and description, characteristics and instructions on the safe use of weapons); and
- intervention strategy.

The practical modules are a crucial training component and are designed to put the trainees in an operational situation and to enable them to adapt to different environmental contexts by training them to take action in a variety of scenarios.

The training modules cover identification of wildlife species, use of wildlife scaring techniques (auditory, visual and pyrotechnical means), use of hunting materials (handling, movement, shooting, maintenance and cleaning) and exercises on intervention techniques and on phraseology.

French Airport Fire-Fighter Training Centre (C2FPA) in Coings, France

To date, C2FPA has conducted more than 180 WHP training courses, educating more than 1,170 trainees and providing more than 16,190 hours of lessons through which officers have acquired well-grounded knowledge.

The modules are put into practice in a four-hectare area specially adapted to replicate an airport environment and so put into practice three crucial areas of WHP:

1. airport environment management (preventive);
2. deterrence measures (remedial); and
3. removal (remedial)

Throughout the training course, the trainees are supervised by wildlife control specialists who use their high level of technical and supervisory experience in wildlife hazard prevention at airports to teach. The trainers' monitoring of **each trainee is personalized** in order to ensure continuous educational advancement.

EVALUATIONS

For each training course, three types of evaluations (diagnostic, formative and summative evaluations) are conducted. They are designed to measure progress achieved and to adapt, if necessary, the course content individually or collectively throughout the training.

Diagnostic evaluations are performed at the beginning of each training course in order to ascertain the trainee's and the group's level of knowledge. Trainers draw on the diagnostic test to adapt the lessons and course content individually and collectively in order to achieve the established goals.

Several formative evaluations are repeatedly conducted during the course in order to assess the nature of any gap found between expected results and actual results, appraise the progress achieved by the trainee, understand the nature of the difficulties encountered and remedy them through additional work tailored to needs. In the event of problems, the programme can be adjusted or complemented.

> Wildlife hazard prevention is governed by strict regulations and calls for qualified and competent staff.

The last type of evaluation is a summative evaluation conducted at the end of the training course. It is used to measure the progress achieved since the diagnostic evaluation, and to validate attainment of final training goals.

Evaluations are conducted by means of a written examination (multiple choice questions) and practical tests on the implementation of various intervention strategies and on

handling the various wildlife hazard reduction materials used by the operator, case studies and trainer-trainee discussions.

The evaluation results are given to the trainee by the trainer on the last day of the course in the form of an individual training report. Following the training course, the report is sent by C2FPA to the sponsor, who is able to ascertain that:

- the knowledge gained during the training course has been transferred to the work post; and
- the employee's skills have really been developed

At the end of the training course, a "wildlife hazard prevention officer" certificate is awarded to each participant and an individual attendance sheet is sent to the sponsor, thus enabling the officer to take up such duties at the airport.

The regulations, obligations and safety challenges are such that officers are required to attend a refresher and further training course at least every four years in order to update their skills. This one-day course is held at the airport and allows officers to raise and discuss problems encountered on their platforms.

To date, C2FPA has conducted more than 180 WHP training courses, educating more than 1,170 trainees and providing more than 16,190 hours of lessons through which officers have acquired well-grounded knowledge. C2FPA, which has been requested to provide services in more than ten countries, also caters to specific training needs and tailors its courses to those requests, bearing in mind the regulations and the obligations of international airport operators.

Since its role extends further than being an airport staff training school, the centre has strong expert appraisal and advisory capability in matters relating to ecosystem knowledge, understanding, management and to appropriate landscaping. It provides customized services and technical support for the conduct of studies, diagnostics and expert appraisals, and proposes action plans for the management of wildlife, wildlife hazard and site development in order to meet the specific needs of airport operators and bodies connected with aviation activities. ■

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Tel: +27 11 607-1234 – **URL:** www.atns.co.za

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As leaders in aviation meteorology, the Met Office College has developed a wide range of training courses for the aviation community which conforms to the latest world meteorological organization training and education guidelines. We teach international best-practice techniques in meteorological forecasting and observing, including the most recent developments in aeronautical meteorology. As well as courses that enable operational meteorological staff to meet ICAO requirements, we also provide training that can help you better understand and interpret meteorological and climatological information and the potential impact on your business. Whichever type of course you choose, our team of highly skilled staff can deliver it either at a location most convenient to you, or at the excellent training facilities within Met Office headquarters.

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Contact: Mr. Eric Rodrigues, Head of ILS Department – **Email:** eric.rodrigues@thalesgroup.com
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NORTH AMERICA

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Contact: Jean LaRoche, Director of R&D, Continuing Education – **Email:** info@cqfa.ca
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Contact: Nicole Mercier, Director, International Development Affairs – **Email:** ena.api@cegepmontpetit.ca
Tel: 450-678-3561 – **URL:** http://ena.cegepmontpetit.ca/

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Contact: Brian Todd – **Email:** info@panamacademy.com – **Tel:** 877-394-2118 or **Int'l Phone:** +1 303-394-2118 – **URL:** www.PanAmAcademy.com

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