The Future of Flight Training

Introduction

The airline industry, perhaps more than any other has throughout its history, been subject to cyclic variations in traffic patterns some of which have been quite spectacular. However, these dramatic excursions mask an underlying growth trend, it is documented fact that if a line is drawn from the traffic at the industry's establishment to the present day it will show a 5-6% per annum growth rate. Let us consider what that means for a moment. If that growth continues – and there is little reason to suppose that it won't – then in 10 years twice as many people will be flying compared with today's traffic and five years after that 15 times more. To help meet that demand the world's aircraft manufacturers have published order backlogs for around 8,ooo aircraft due for delivery over the next 10 years. While some of these aircraft are for fleet replacement a significant majority will lead directly or indirectly to the world's air transport network expanding. These aircraft will require pilots and those pilots will require training. Training from initial schooling through advanced ratings and onwards to the recurrent training that is part and parcel of the pilot's profession.

Against this background it is no wonder that in recent years there has been a debate, increasing in intensity, about pilot training. In the last 12 to 18 months this debate has expanded to include a discussion about the appropriate level of experience required for a new hire airline pilot. Much the input to the debate, certainly from the operator's point of view has focussed on ways of reducing the cost burden of training while at the same time increasing the speed of reaction to business growth opportunities. Against a business background featuring growing competition, and increasingly demanding economic environment, this is understandable. The problem is that it is a one-dimensional approach to the problem and as such risks being an incomplete one.

Meanwhile some regulators, at the behest of legislators have promoted "quick fix" solutions to training shortfalls. These, although making for good headlines again fall into the trap of being too simplistic to be completely effective.

IFALPA argues that a more comprehensive review of pilot selection, initial and on-going training, must be carried out, after all history has shown that, time after time, excellent and in depth professional pilot skills are a pre-requisite for safe operations and that these skills will stand up even under the most demanding of circumstances.

That is why IFALPA training experts are working to create a blueprint for a comprehensive programme of training standards and concepts not only aimed at providing student pilots with the skills they will need to be effective professional pilots but goes on to ensure that these standards are not only maintained but enhanced over the pilot's whole career.

Collectively the programme is known as the IFALPA Pilot Training Standards (IPTS). It is not the purpose of this document to describe the minutiae of the IPTS, these will be published in the IPTS Manual in the Spring of 2012, rather the goal of this publication is to set out what factors have been defined as elemental and what dynamics have created them.
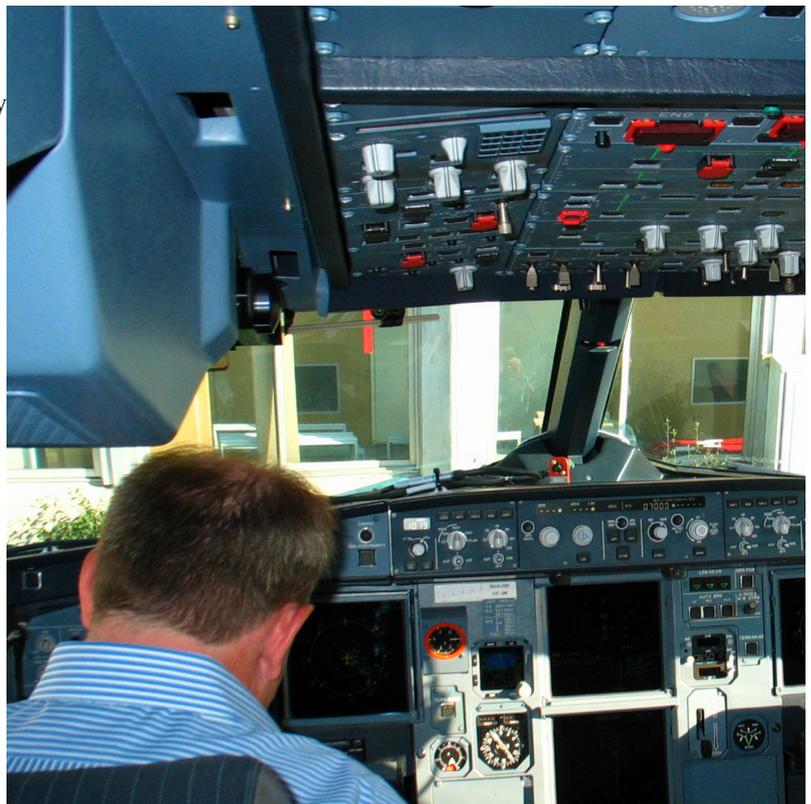
What can we say for sure about this pilot's training ? How can it be guaranteed that it fits with the requirements of the operational environment?

Defining effective training

What is it that makes a good pilot? To answer this question it is a good idea to pose this question about the role – What does the job require, aviators or system managers? The answer is that the job requires both skill sets and the ability to switch between the two as rapidly and frequently as the circumstances require. While much of the work is procedural in nature, pilots have to be able to depart from linear thinking and, as consultants would have it, "think outside the box" in order to deal with unexpected and undefined events.

Pilot Selection

The first step in any effective training process is to make sure that the candidate has what the social commentator Tom Wolfe described as "The Right Stuff" to become an airline pilot and go on to

Fig 1 The importance of the different skill sets varies with current circumstance and, accordingly, an effective training programme must be aimed at first reconciling these skills and then optimising the interplay between them.

enjoy a successful career. The first element is a combination of ability, desire and the means to succeed. But beyond the desire and drive to succeed in a career that includes a number of pressures (anti-social working, job insecurity, base mobility) not seen in other professions, what attributes and experience have been identified as desirable in pilot candidates?

Pilot Pre-requisites

➤ **Education** – A good standard of academic attainment involving study of key subjects including mathematics, physics and mechanics as well as a proficient level of English. This demonstrates the candidate's patience and motivation to study 'difficult' subjects as well as the ability to synthesize skills learned in initial training and throughout an airline career.

➤ **Co-ordination/psychomotor skills** – While the exceptional co-ordination abilities of an astronaut or fighter pilot are not necessary for airline flying, flying an aircraft requires good coordination of movements, provided a candidate has good basic motor skills, then this ability can be shaped and tuned in training. Accordingly they must be checked in screening. While flight simulation tests can be useful they can be replaced with other tests, which measure coordination and the ability to operate in a three or four-dimensional environment.

➤ **Social/psychological skills** – A passion for flying is beneficial since it demonstrates a strong potential for long-term commitment to flying as a career and the determination to develop above average flying skills. It goes without saying that this passion for flight should not be used by airlines to convince new hire pilots to shoulder the burden of professional training for new hire pilots. In addition candidates should also possess strong problem solving, decision-making and stress management skills allied with good leadership and team member skills. Given the international nature of many flight operations care should also be taken to ensure candidates have good cross cultural skills.

➤ **Medical** – Pilots must be fit for future challenges and accordingly good physical and emotional fitness are essential for the profession.

Selection process

The aim of any pilot candidate selection process should be a simple goal to select candidates who will not only have a good chance of successfully completing initial training but to also continue to develop a strong lifetime performance. Accordingly the selection process must be flexible and, for validation purposes, there should be a continuous feedback monitoring the results of previous selected candidates performance. Who better than pilots to determine the right individual for selection? History has shown that a few carefully considered questions from a pilot have revealed fundamental shortcomings in apparently outstanding candidates. Accordingly the pilot group should not only be involved in selection but also have the final say in selection of candidates.

Finally, the ability to finance training should not be a barrier to the right candidate.

Philosophy of Pilot Education

In order to create a programme, which maximises the potential of the student pilot, it is important to acknowledge the difference between training (which develops response structures) and education (which develops airmanship). Since professionalism can only be created through a combination of the two. Remember, while proficiency can be described as the completion of the competency requirements, the aim of professional pilot training should extend well beyond this benchmark.
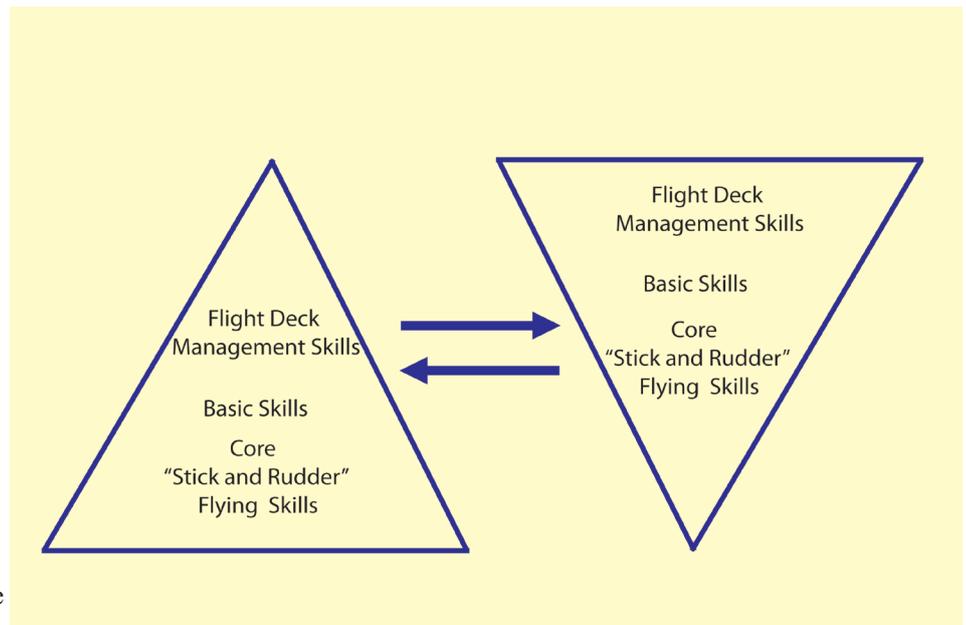
So what then must be taught to the student "off the street" so that they become qualified to be considered as a prospective airline pilot?

➤ **Basic flying skills** – The core competencies of basic flying skills are the foundation upon which everything else is built – and they serve a lifetime. The history of air transport is littered with examples of when core airmanship and piloting skills have meant the difference between an incident and a major accident. For this reason the initial phase of flight training should be focused on establishing this foundation. Accordingly, this should be carried out primarily in single engine aircraft under Visual Flight Rules (VFR) conditions. Furthermore training should be carried out in aircraft capable of aerobatics so an awareness of the entire flight envelope is developed. Likewise some training in gliders will also bring significant benefit to the student.

➤ **Intermediate Training** – The ability to monitor is a vital requirement for an airline pilot. In the second phase of flight training it should migrate into a two pilot environment that encompasses both VFR and Instrument Flight Rules (IFR) operations. This brings an early exposure to the concept of crew operations and develops Pilot Not Flying (PNF) or Pilot Monitoring (PM) skills. This allows the student to further develop situational awareness and communications skill sets.

➤ **Advanced Training** – In the final stages of flight training so called third pilot concepts should be introduced since the use of automation is a core element in flight operations. The ability to assimilate and maximise the use of automation technologies is therefore a vital element to be developed in the ab initio stage of training.

➤ **Additional Training** – In addition to the traditional subjects covered in ground school courses in Safety Management Systems, medical issues, the air traffic control system and aviation history should also be taught. Likewise other non-technical courses for example Crew Resource Management (CRM), threat and error management and a variety of other pertinent courses should be part of a "holistic" teaching programme.

How should we train?

➤ **Immersion environment** - We should also consider how the training environment can be optimised to maximise results. It is clear that a high quality environment in terms of facilities and environment yields more effective training with an immersion training environment allowing students to live, eat, sleep and dream flying the ultimate solution. In this type of environment a student is not only free of distractions but also able to profit from a peer support network - hangar flying brings tangible training benefit.

➤ **Training tools** – Devices like computer based training in support of classroom leactures and individual tutor support will allow students to progress at the right speed for the individual and should be a constituent part of the curriculum.

Flexible curriculum – The curriculum should avoid the "one size fits all" approach and be flexible enough to allow a continuous evaluation of the training process and furthermore that flexibility should enable students and instructors to adapt the content to ensure the goal of a high quality airline pilot is reached.

Instructor cadre – If the goal of high quality training is to be reached then an obvious goal is to provide high calibre instructors at the ab initio stage. High quality and highly motivated instructors will train students to higher proficiency far more efficiently when compared with those of a lower calibre. Instructors must have appropriate qualifications from a formal course and this training should follow a screening process that includes peer/pilot input. Clearly this will require a higher initial investment but the dividends will more than outweigh this cost over the span of a career.

Recurrent training

The hallmarks of a good recurrent programme – Primarily a confidential environment must be provided to provide both pilots and instructors with open lines of communication. This in turn will provide feedback to both parties on their respective performance. The focus should be on learning rather than checking and the pilot under training must have input into what activities will be carried out in the free time in simulation sessions – this flexibility has led in the past to valuable knowledge being gained. Knowledge that has literally been a lifesaver. Naturally, training should take place in the highest fidelity of simulator available. In addition to the actual on equipment time, sufficient time should be allocated for briefing and de-briefing the session to ensure the maximum benefit is gained.

Real world scenarios - Training scenarios should be based on real world events derived from objective data (for example FOQA or LOSA or PIREPs) in order to prevent incidents from having an opportunity to develop.

Training intervals – The "one size fits all" approach in defining intervals for recurrent training does not have the flexibility to take into account the variables in specific operation. Accordingly, these should be tailored in conjunction with the national regulator to the specific requirement of an airline's operations.

Conclusion

In order for a pilot training system to be successful; the education, awareness, and input of all stakeholders (authorities, regulators, manufacturers (OEM), airline management, flight school management) are crucial. Additionally, the emphasis must change from checking pilot skills to training pilot skills. This training must be set in an overall training management system where every participant understands his responsibility and has received the necessary training to be competent and confident in exercising his job.

This position paper will be expanded and developed into an IPTS Manual.