MPL represents a state-of-the-art ab initio airline pilot training programme

The newly established multi-crew pilot licence is focused from Day One on preparing the co-pilot candidate for the right seat of an advanced airliner, using a competency-based approach to training developed with an emphasis on improving flight deck safety

The nature of the multi-crew pilot licence (MPL) that was introduced late last year is not clearly understood throughout the aviation community. In part this lack of comprehension has been fuelled by inaccurate statements about the newly created licence that have appeared in media reports. While the aviation community generally has been supportive of the new licence, certain comments based on misunderstandings about the rationale for the innovative programme have been unsupportive and could impede this valuable endeavour even before its advantages take effect.

The new licence qualifies the holder to perform co-pilot duties on aeroplanes operated with more than one pilot. It complements, and does not replace, existing ways of qualifying as a co-pilot for multi-crew operations (see “Technological advances facilitate change in licensing and training standards,” ICAO Journal Issue 2/2006, page 22).

The MPL reflects the competency-based approach to training that was introduced by a 2006 amendment to ICAO Annex 1 (the annex to the Chicago Convention which contains provisions for personnel licensing). The new licence was subject to a risk and safety benefit study conducted by an ICAO panel of experts. Moreover, MPL implementation incorporates specific risk control measures developed by the expert panel, as well as a post-implementation proof-of-concept programme.

One common misconception about MPL is that the programme emerged as a countermeasure to the pilot shortage in Asia, and especially in China and India, where the pool of qualified personnel cannot keep pace with current industry growth. In fact, the MPL programme simply recognizes the significant advances in methodology and technology in the training sector that allow the air transport industry to sustain rapid growth by generating an influx of more appropriately trained pilots.

The MPL is part of sweeping changes to ICAO Annex 1 which came into effect in November — the first major update of the annex’s provisions since 1948. When the initiative to modernize the international training provisions commenced in October 2000, there was no pressure to address the problem of a worldwide pilot shortage. Indeed, when the ICAO Flight Crew Licensing and Training Panel (FCLTP) convened its first meeting in 2002, the world’s aviation community was still feeling the repercussions of 9/11, an event that suppressed demand for air transport services, and hence pilot recruiting. While the panel was not concerned about a pilot shortage, however, it was patently obvious that the 40-year old standards and recommended practices (SARPs) of Annex 1 (as well as the SARPs of Annex 6, which is concerned with the operation of aircraft) had become out of step with the evolving best industry practice and did not reflect the capabilities of advanced training devices, especially in the area of high-fidelity simulation.

The panel of experts that agreed on the changes needed in Annex 1 — subsequently reviewed by the Air Navigation Commission and approved by the ICAO Council — were nominated by 15 member States and a wide range of industry bodies representing pilots and aircraft operators, including airlines. One of the tasks facing this diverse group of experts was to evaluate alternative approaches to ab initio training for pilots to be employed in air transport, and today’s MPL is the outcome of this comprehensive effort.

There is a perception among some that the MPL was created primarily as a means to save time and money by investing less in training. The FCLTP experts who fashioned the programme during the 2002-06 period were unanimously motivated by a desire to improve the safety standards that govern the operation of modern multi-crew civil aircraft. The MPL initiative was not driven by economic factors, although most members of the FCLTP, now disbanded, foresaw that the operations-oriented training approach could also reduce the duration and cost of pilot training.
The new MPL, as defined by Annex 1 and the first edition of ICAO Document 9868, the Procedures for Air Navigation Services – Training (PANS-TRG) that became applicable late last year, represents the best documented training system in ICAO’s history. ICAO requirements include a stringent qualification standard for the approved training organizations that intend to deliver MPL training, as well as a data exchange between aviation authorities, training organizations and airlines. Also required is a continuous assessment of the student’s performance during all phases of the MPL course.

Document 9868 prescribes the MPL training scheme in detail, as well as the required competency units and their elements, the respective performance criteria and instructor competencies. The document also furnishes States with guidelines for implementing an MPL programme; importantly, this includes guidance on the design and development of the MPL course, sample training objectives and assessment material, and explanations for the application of the threat and error management framework as an overarching principle that pervades all flight operations.

Contrary to the traditional ab initio training path, which is based on inventory and hours logged, the MPL training scheme is focused on the need to develop competencies which were identified by analysing the tasks performed by a crew operating a modern multi-crew transport in all phases of flight. In accordance with modern instructional system design, these competency units were broken down into elements which were further divided into performance criteria or statements of observable behaviour, each corresponding to a training objective. Course developers are able to establish an effective curriculum by defining the ultimate training objectives and mastery tests and then highlighting the training modules and devices required to develop these skills.

Some in the industry are under the impression that MPL candidates are not required to obtain solo flying experience. On the contrary, there was never a doubt about the necessity of including solo flying in the programme. Some pilot-in-command experience is important for building confidence. For this reason, the International Air Transport Association (IATA) supports retaining the Annex 1 requirement for a minimum of 10 hours of solo time. In all, the candidate is required to log a minimum of 240 hours. The flight experience in aircraft must include cross-country navigation, night operations, upset recovery and flight by reference solely to instruments. Much of the flying is acquired during Phase 1 (Core) of the four-phase programme.

Although the principle of threat and error management, as a fundamental aspect of multi-crew operations, is introduced at the earliest stage of MPL training, the capacity of a small single-engine aeroplane to meet multi-crew training objectives is admittedly limited. In this respect, training devices that provide for multi-crew interaction play the more effective role.

Training for multi-crew flight operations starts in earnest with Phase 2 (Basic) and remains on an operational basis for the subsequent training phases. In Phase 2, the relevant flight simulator training device must be — to borrow the term adopted for European regulations — at minimum a flight and navigation procedure trainer compliant with the multi-crew concept (FNPT II/MCC), and ideally should represent the specific aircraft type in use by the airline. The flight simulator training device can also represent a generic turbine-powered, multi-engine and multi-crew aeroplane. Whether generic or not, it is required to feature a daylight visual system designed so that both pilots can see the

continued on page 31

Capt. Chris Schroeder is Assistant Director, Flight Operations for the International Air Transport Association, and is based in Montreal. Capt. Dieter Harms, a Senior Consultant to IATA, served as an adviser to the ICAO Flight Crew Licensing and Training Panel until it was disbanded in 2006.
**Bustling aerotropolis**

continued from page 23

of airports, the effect can be seen in the typical price reduction of consumer goods in some airport shops immediately after they have been privatized.

Privatization also usually provides access to non-traditional sources of capital for financing airport infrastructure and development of services.

Globalization is the removal of trade boundaries, something that will facilitate the creation of an aerotropolis. Once such boundaries are broken, enhanced competition resulting from a liberalized market ensures sufficient economic advancement to facilitate the emergence of the aerotropolis.

An aerotropolis need not necessarily be built near a major hub airport. The potential for an aerotropolis would lie primarily in the airport's location, and secondly on whether a nearby aerotropolis exists in a neighbouring country. Taking account of these factors, airport planners can begin building an aerotropolis gradually. Aside from the local attractions, in particular the uniqueness of the environment, the absence of similar facilities in neighbouring countries would be significant as demand for such facilities rises around the world.

The aerotropolis venture has yielded exponential increases in job opportunities for the local population, and an influx of foreign exchange. Therefore this concept, which has been tried and tested, should be on the minds of any airport and urban development planner, particularly in tourist destinations. A fitting example is Miami, which experienced a boom in airline passenger traffic following the opening of the nearby Walt Disney World theme park.

**Tanzanian meteorological services**

continued from page 11

The outcome of this work was the publication of a document on the principles of determining the cost of aeronautical meteorological services for en-route and terminal air navigation. The document highlights relevant aspects to be used internally to determine the cost of providing aeronautical meteorological services. Among aspects that it found must be taken into account are the investment expenditure including maintenance, operating and administrative costs, and the expenses related to training. The allocation of such costs between aeronautical and non-aeronautical users must also be considered, as well as the allocation of aeronautical meteorological services costs to the en-route and airport components.

In developing its own document, the TMA used relevant ICAO manuals as reference, in particular ICAO’s *Policies on Charges for Airports and Air Navigation Services* (Document 9082), the *Airport Economics Manual* (Document 9562) and the *Manual on Air Navigation Services Economics* (Document 9161). Also referenced was WMO Guide No. 904, *Aeronautical Met Services Cost Recovery*.

The charges currently levied for both air navigation and airport landing and parking have been in effect for many years without review. Although there have been new infrastructure and technological developments, no significant change has been made to match the operating costs. However, following a costing exercise which came up with higher amounts than what could be recovered from airlines at the time, the Tanzania Airports Authority, CAA and TMO made interim arrangements whereby a portion of the recovered costs would be allocated to each body on the basis of mutual agreement.

**The way forward.** As the body coordinating the cost recovery for air navigation services in Tanzania, the CAA is in the process of assessing the cost for the provision of such services with the goal of revising charges. The Tanzania Meteorological Agency will participate in this process, anticipating that new cost recovery charges will be based on both the current and forecast levels of traffic.

In the meantime, the TMA strives at improving the quality of aeronautical meteorological services through the modernization of its equipment and through improved internal, regional and international communications using high-speed data links. The agency is also focused on the further development of human resources.

**Multi-crew pilot licence**

continued from page 16

same imagery, thus enhancing crew coordination, situational awareness and call-out procedures. At this early stage of the programme, motion capability is not a requirement.

The flight simulator training device used in Phase 3 (Intermediate) must represent a specific turbine-powered multi-engine aeroplane type that requires two-pilot operation. The device must be certified to a standard equivalent to JAR/FAA Level B, which means that it has to be capable of simulating full daylight operations while providing each pilot with a continuous cockpit-wide minimum collimated view through 180 degrees horizontally and 40 degrees vertically. The Phase 3 device, which must incorporate air traffic control (ATC) simulation, is also required to provide a motion cue.

The simulator used in Phase 4 (Advanced), the final phase of the training programme, must be fully equivalent to a Level D or Level C flight simulator training device. This calls for an enhanced daylight visual system and ATC simulation.

One outstanding issue to be addressed concerns instructor qualification. Although not explicitly mentioned in the revised Annex 1 or PANS-TRG, instructors assigned to provide training in an MPL course need to be specially qualified for this role. In Europe, for instance, this question has been addressed by requiring that all MPL instructors complete an MPL instructor’s training course. The objective is to ensure that instructors are able to comply with a competency-based approach to pilot training and assessment. Among other things, the two-day course deals with the integration of the threat and error management framework throughout the training process. It finishes with an assessment of the candidate instructor and a certificate for successful applicants. For instructors involved in the basic, intermediate or advanced phases of the MPL course, some experience in multi-crew operations is also a requirement.

Training for the MPL qualification is likely to be offered in all parts of the world. In Europe, for example, the MPL programme has already been introduced. However, compared to ICAO Annex 1 and PANS-TRG, the new Joint Aviation Requirements (JAR-FCL-1) are more prescriptive in certain areas, specifically with regard to the qualification of MPL instructors, the definition of the flight simulation training devices to be used in the different training phases, and the simulation of the ATC environment in the third and fourth phases of the training programme. Also spelled out are the particulars of the contractual agreement between the flight training organization conducting the MPL course and the airline intending to hire the graduates, as well as a requirement for monitoring implementation
of the programme through an advisory board composed of representatives from aviation authorities, airlines, approved training organizations and pilot associations.

This at first glance is a very positive development. The only possible drawback is that the prescription of stricter standards by one authority may lead to different qualities of MPL training found around the world.

Among other examples of MPL implementation, the Australian Civil Aviation Safety Authority (CASA) has drafted amendments to its regulations and relevant civil aviation advisory publications to cater to the new programme. The consultation phase is under way and final amendments are expected to be adopted in November 2007. In China, the General Administration of Civil Aviation (CAAC) is in the process of amending its regulations in order to implement the new training programme. A number of other countries are involved in a similar process.

Several ongoing and future activities are expected to support the implementation of the new training regime. For example, a proof-of-concept initiative was launched by ICAO in January 2007 (see box on page 15) with the objective of facilitating the collection of relevant data that can assist national aviation authorities in implementing MPL and also for preparing necessary updates to PANS-TRG. A conference on the proof-of-concept results is expected to be held in 2009 or 2010.

An international working group was formed in June 2006 by ICAO for the purpose of updating ICAO Document 9625, the Manual of Criteria for the Qualification of Flight Simulators. This focus on flight simulation technology was undertaken at the urging of the U.S. Federal Aviation Administration (FAA), in light of the need for a more precise definition of the different types of flight simulation training devices required for each phase of the MPL course.

With assistance from the Royal Aeronautical Society (RAeS), the objective of the ICAO working group is to establish qualification standards for the approval of all flight simulator training devices on a worldwide basis. This is a major endeavour aimed at reversing an existing situation whereby the technical capabilities of simulators determine how these devices are used in training. Once global standards for such devices are in place, the required simulator fidelity and technical complexity will be defined by training needs. The newly formed group intends to publish an updated and expanded Document 9625 by the end of 2008.

Yet another supporting activity has been initiated by IATA, which is convinced that the MPL represents the state-of-the-art ab initio airline pilot training programme. Through its own global initiative, and for the benefit of its member airlines, IATA intends to spearhead the worldwide standardization and harmonization of MPL implementation. This initiative, which it is undertaking in close coordination with ICAO, will include the establishment of a working panel. Panel members will represent airlines, training providers, aircraft manufacturers, regulators and pilot associations — in short, all MPL stakeholders from all corners of the globe.

Multilateration technology
continued from page 14

system’s flexibility, breadth of application and economic advantages are being demonstrated daily. As in communications, where data links in certain applications are gradually supersed-