READY

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Booming growth in air travel in Europe and there are fueling an international effort to

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Here's a novel idea: A 20-year-old not authorized to solo a Cessna 150 could soon be flying from the right seat of the airliner next to you on the parallel approach.

Sound preposterous? It may happen.

In November 2006, the International Civil Aviation Organization (ICAO) completed an amendment to Annex 1 of the Convention on International Civil Aviation. The amendment gives countries guidance in creating a new pilot certificate called the Multicrew Pilot License (MPL), which is generating a great deal of interest in Europe and Asia because those areas of the world have an acute shortage of qualified airline pilots.

Proliferation of the MPL could become one of the most significant changes in aviation history, redefining how airlines select and train pilots. As the MPL concept is already eliciting support from airlines and aviation training organizations around the world, today's airline pilots must understand the ramifications of this new licensing strategy and how it will affect both today's and tomorrow's air transportation system.

For today's airline pilots trained through traditional U.S. and Canadian aviation programs, the MPL may be difficult to comprehend. Most of us gained our place in the cockpit by earning certificates, ratings, and flight experience via military or civilian aviation, or both. But whatever our route, it included acquiring hundreds, if not thousands, of hours of actual aircraft command experience before we were hired by an airline and then successfully completed the initial aircraft qualification training and evaluation that every airline requires of each newly hired pilot.

MPL concept

The MPL will be a limited pilot certificate that will allow the holder to act as second-in-command (SIC) in air transport operations of a turbine-powered transport-category aircraft that requires two or more pilots. The pilot will have instrument privileges as SIC and be type-rated (as SIC) in the aircraft. The significant philosophical change with the MPL is that the orientation of the training is toward teaching the candidate to be a competent SIC pilot flying solely under the authority of the captain. Traditional training programs have focused on training pilots to develop competency in pilot-in-command (PIC) decision-making and flying skills attained by acquiring PIC experience in the process of earning private, commercial, and advanced pilot certificates along with an instrument rating.

The foundation of MPL training will be *ab initio* (from the beginning) training coupled with advanced flight simulation substituted for a large part of the flight training that has been previously required to be conducted in an actual aircraft. MPL training will focus primarily on training a pilot to be a competent supporting flightcrew member on an airliner by providing intensive training on advanced turbojet aerodynamics, new aircraft technology, crew resource management (CRM) techniques, and threat- and error-management principles. Candidates also will be trained in the aircraft-specific standard operating procedures for the aircraft in which they will initially be assigned to fly and in irregular and emergency procedures for that aircraft.

The MPL concept envisions replacing actual aircraft experience with training in flight-training devices (FTDs) and full-flight simulators. MPL uses a competency-based training approach that allows trainees to progress through the program when they are competent at various "gates" rather than when they meet an overall flight-experience level at the end of the program. This competency-based approach is similar to that currently employed in the advanced qualification training programs (AQPs) that a number of U.S. and Canadian airlines are using today.

Ab initio training

The concept of training pilots *ab initio* is not new. In the airline context, *ab initio* training allows a candidate with no previous aviation experience to be evaluated by an airline and, if selected, to begin a stringent training program to qualify as a flightcrew member in that airline's cockpits.

Some U.S. airlines in the 1960s—including Eastern, TWA, and United—experimented with *ab initio* training by taking selected candidates with little or no experience and moving them through an optimized training program to obtain the necessary FAA certificates in minimal time and enter the airline's seniority list as flight engineers. That program was short-lived, as the up-and-down economic cycles in aviation soon allowed these airlines to hire enough qualified, experienced pilots.

However, in Europe, where general aviation is much less robust than in the United States and Canada, *ab initio* training programs are the norm; airlines such as Lufthansa have used them successfully for decades. These programs permit the airline to oversee the pilot's progress through primary and advanced training and to evaluate, throughout the entire program, the pilot's potential to become a competent flightcrew member.

Today, flight-training schools in the United States, such as the Delta Connection Academy, provide airline-oriented *ab initio* training and then promise job interviews with regional airlines such as American Eagle, Comair, and Skywest to pilots who successfully complete the training.

In addition to the *ab initio* flight-training programs sponsored by a particular airline or group of airlines, a number of universities throughout the United States, such as Embry-Riddle and the University of North Dakota, plus several universities in Canada, offer training programs focused on producing professional airline pilots. Although the relationship is not as formal as the programs sponsored by the airlines, the airlines nevertheless find candidates graduating from these university programs appealing, as they understand that these pilots have received academic training in such subjects as CRM and advanced aviation technologies taught in conjunction with a focused flight-training program.

OR NOT

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Asia and an acute shortage of airline pilots
o put 240-hour copilots in airline cockpits.

LPA ICAO Flight Crew Licensing Project

Advanced simulation in flight training

In the late 1960s and early 1970s, motion simulators began to be incorporated into airline pilot training. These simulators held the promise of providing better training. Better technology allowed a more realistic training environment. Training in a simulator was much less expensive than in an airplane and so permitted additional training to be offered at the same or less cost to the training facility. Training in advanced flight simulators also provided safety benefits by allowing pilots to practice simulated failures and procedures necessary to handle the airplane in an actual emergency that would have been risky to practice in an actual airplane.

Initially, simulation was used solely as an adjunct to training in an actual airplane. However, in 1980, the FAA issued Appendix H to FAR Part 121, permitting 100 percent of the required new-hire initial pilot training to be conducted in an advanced simulator if the airline chose to specially qualify instructors to accomplish this new type of training and to formalize simulator-maintenance programs. But Appendix H simulator training was given only to experienced pilots who had already acquired valuable flying skills by flying hundreds, sometimes thousands, of hours in airplanes and who had already demonstrated their aviation acumen by having previously earned their private and commercial pilot certificates and multiengine and instrument ratings before being hired by an airline.

As many simulator instructors and check airmen have heard from pilots, "the simulator just doesn't fly like the airplane." Advanced simulators originally were designed to enhance the *existing* skills that the pilot already possessed from experience in actual aircraft, not to teach primary flying skills.

Some useful by-products came out of advanced simulation, such as line-oriented flight training (LOFT), in which technical piloting skills could be evaluated and integrated with CRM skills. These concepts would be cornerstones of the AQP concept developed in the 1990s.

Until the late 1980s, the FAA and Transport Canada required airlines to train pilots in ground and flight programs that required a minimum number of training hours, much like the experience requirements for pilot certificates and ratings. These programs mandated that the airline's pilots complete a set number of required hours in ground school subjects and receive a minimum number of flight-training hours in the simulator and/or airplane. In many instances, the FAA would allow airlines to reduce the standard number of FAA-required training hours if the airline training department developed a means to improve the delivery of training such as by incorporating advanced audio and visual training media into their programs.

In 1996, the FAA created FAR Part 142, which allowed approved training centers greater use of simulators and training devices in lieu of actual aircraft training hours to meet the certification requirements of FAR Part 61. ALPA made the following comments to the FAA in response to the creation of FAR Part 142: "While… advanced simulation reached unparalleled levels of realism, and we strongly support increased use of advanced simulation, … other factors … are important, especially for low-time pilots. One factor is familiarity with air traffic control (ATC). Unless every simulator flight is conducted as line-oriented flight training (LOFT), a great deal of required ATC interaction is missed. [T]he operation[al] and decision-making experience … one receives in an aircraft and in an ATC environment, including interaction with other aircraft,… makes [him or her] a safer pilot."

Coming pilot shortages

Generally, airlines in North America have not needed to train pilots through *ab initio* programs because, until recently, general aviation here was relatively robust. And for the last several years, when hundreds of previously qualified airline pilots were furloughed from major airlines, North America had no apparent shortage of experienced pilots waiting for the airlines to hire them. For these and other reasons, interest in the MPL concept in the United States is low right now. Although some airlines and aviation training centers would like to see the FAA add the MPL to FAR Part

61, the agency does not appear inclined to do so at this time.

However, this may change.

Preliminary forecasts from FItops.com predict that 120,000 new pilots may be needed in the United States alone by 2017—partly, and ironically, because of the aviation economic downturn of 2001–2006 that devastated the working conditions and financial security of many airline pilots. The supply of once-qualified pilots is beginning to dry up as more pilots leave the airlines before reaching mandatory retirement age to pursue other opportunities outside of aviation. Also, pilot candidates who might once have been interested in airline careers are now becoming discouraged by the high costs of training (because of fuel), low initial pay, and the prospect of an uncertain and insecure career with any of the major airlines.

Unlike the U.S. FAA, Transport Canada has indicated considerable interest in incorporating the MPL into Canadian regulations and is already using some university flight-training programs to promote the concept.

Where should ALPA stand on the MPL?

ALPA acknowledges that an airline pilot shortage may develop in North America in the near future and that we must engage in the process of determining appropriate methods to address the future need for well-trained pilots. MPL training may provide benefits if developed and implemented in a manner that incorporates the proven flight-training concepts developed under traditional training methodologies during the past 30 years, coupled with carefully chosen MPL candidates with the acumen to complete the MPL program. But because the MPL training program concept is, as yet, untried and unproven, close regulatory oversight will be critical in ascertaining whether those graduating from the programs leave with the knowledge and skills necessary to serve as a safe and competent member of an airline flight crew.

ALPA recognizes that it may be possible to efficiently train competent airline flightcrew members through an expedited flight-training program that uses minimal actual aircraft flight-training program, such as one conducted by an FAA-approved school, to use a simulator or flight-training device to reduce the standard number of required hours of aircraft experience. Otherwise, simulator time has not previously been counted toward the actual flight experience necessary to fulfill the flight-hour requirements for obtaining a specific pilot certificate. Additionally, not all of the 240 flight-training hours necessary for the MPL are required to be as PIC; a portion of those hours can be obtained while serving as the pilot monitoring (PM) or pilot not flying (PNF).

A controversial aspect of the MPL training program is the lack of actual aircraft training or experience requirements. The only actual aircraft training required by ICAO criteria is that the MPL candidate obtain 35 hours in an actual airplane during the core flying-skills phase of training, and log 12 takeoffs and landings in the aircraft in which the candidate will be type-rated during the final phase of the MPL course. The required 35 hours of actual airplane training may be

General Requirements For the MPL

The MPL applicant must

- be at least 18 years old,
- meet the knowledge requirements of an airline transport pilot,
- possess skills required for flying in airline transport operations,
- be able to perform as a copilot in a turbine-powered airplane that requires at least two pilots, and
- possess a Class I medical certificate.

The holder of an MPL will *not* be able to exercise the privileges of a private pilot unless he or she separately completes the licensing requirements for the private pilot certificate. MPL holders will possess an instrument rating for multicrew operations only. They may apply for pilot-in-command (PIC) instrument privileges by demonstrating competency later. Multicrew pilots can apply for a traditional commercial pilot certificate when they meet the requirements for commercial pilots.

Pilots with multicrew pilot licenses must have a minimum of 240 hours of *combined* aircraft and simulator *training* experience. This is a departure from the traditional aircraft experience requirements in the United States and Canada.

Historically, only actual aircraft experience counted toward the traditional pilot certificates except where the regulator permitted a specific

Table 1: Minimum Hours to Obtain Commercial, Multiengine, Instrument, and Type Ratings

	U.S. FAR 61	U.S. FAR 61 and FAR 142	U.S. FAR 141	Canada CAR	ICAO MPL
Total training	80	100	175	92	240
Total FFS/FTD	50	100	73.5	45	210
Total aircraft	200	150	119	250	30
Total solo/PIC	100	100	15	100	10

Sources: U.S. FAR 61 certification: pilots, flight instructors, ground instructors
U.S. FAR 142 training centers
U.S. FAR 141 pilot schools
Canadian Air Regulations, Standard 421, Flight School Permits, Licenses, and Ratings
ICAO Annex 1, Amendment 167

experience by coupling established and proven flight-training concepts with new and innovative flight-simulation technologies. However, the current MPL training "footprint" in ICAO guidance doesn't require high-fidelity simulation (such as U.S. Level C and D simulator standards) until the final advanced phase of training. As the MPL training program incorporates minimal actual aircraft training experience, ALPA feels that, at a minimum, high-fidelity simulation should be used throughout a majority of the training.

ALPA believes that a data-driven approach is necessary to ensure that MPL candidates meet or exceed the standards established for traditional training. This data-driven approach has been successfully applied to other certification endeavors such as extended twin-engine operations (ETOPS). The MPL concept must be demonstrated and proved using quantifiable metrics before a candidate in this program is permitted to perform flightdeck duties in airline operations. This process should include having line pilots who fly airliners every day help define the "competencies" required of MPL pilots.

The MPL should not be considered as simply a new licensing standard, but rather as a totally new training process and methodology. To have a chance at being successful, this training process must be constructed with input from all stakeholders, including training device manufacturers, training providers, regulators, ALPA, and most importantly, the airlines that may hire future MPL pilots. Only a well-devised MPL process will help overcome the challenges posed by a flight-training program that purports to use minimal actual aircraft training.

Only after ALPA is convinced that the MPL concept does not mean less safety for crewmembers, passengers, and the general public will the Association be able to support this new training initiative. As airline pilots, we are trustees of this profession, and we have a responsibility to ensure that our high training standards are preserved for future generations of airline pilots.

Table 2: MPL Training Scheme

Minimum 240 hours of training including pilot flying (PF) and pilot not flying (PNF)

Phase of training		Training items	Flight and simulated flight training media—minimum level requirement		Ground training media
Integrated Threat- and Error-Management Principles	**Advanced** Type rating training within an airline-oriented environment	• CRM • Landing training • All-weather scenarios • LOFT • Abnormal procedures • Normal procedures	Airplane: Turbine Multiengine Multicrew certified FSTD: Type IV	12 takeoffs and landings as PF PF/PNF	• CBT • E-learning • Part task trainer • Classroom
	Intermediate Application of multi-crew operations in a high-performance, multiengine turbine airplane	• CRM • LOFT • Abnormal procedures • Normal procedures • Multicrew • Instrument flight	FSTD: Type III	PF/PNF	
	Basic Introduction of multi-crew operations and instrument flight	• CRM • PF/PNF complements • IFR cross-country • Upset recovery • Night flight • Instrument flight	Airplane: Single- or multiengine FSTD: Type II	PF/PNF	
	Core flying skills Specific basic single-pilot training	• CRM • VFR cross-country • Solo flight • Basic instrument flight • Principles of flight • Cockpit procedures	Airplane: Single- or multi-engine FSTD: Type I	PF	

Source: ICAO PANS-TRAINING

reduced to 30 hours, and the number of landings performed in the actual type-rating aircraft may be reduced to 6, if a full-motion advanced simulator is used (which it will be) in the training program.

Table 1 compares the *minimum* number of hours required to obtain a commercial pilot certificate, instrument and multiengine ratings, and aircraft type ratings under different regulations. Multiengine and specific aircraft type ratings do not have specific minimum-hour requirements (except in Canada), so it is assumed that these ratings are added during commercial or instrument training. Few pilot candidates are able to demonstrate adequate proficiency to be issued a pilot certificate by completing only the minimum hours.

The MPL training program must include training in airplane upset recovery plus threat- and error-management principles as applied in multicrew environments. CRM training as currently applied in many U.S. and Canadian programs is assumed to be included in this requirement.