



**ECA**  
Piloting Safety

## **ECA Position Paper on Multi-Crew Pilot License (MPL)**

### **1. Introduction**

Over the past years, the aviation world has realised that a too high dependency on automation can potentially cause safety issues. One reason is that automation has pushed manual flying skills into the shadows. Today, pilots fly airplanes manually only a fraction of the time so their skill set is struggling to maintain the necessary level of proficiency. Early 2013 both the EASA and the FAA have issued bulletins advising operators to give guidance to their flight crew to switch off automation if conditions allow. Additionally an aircraft manufacturer has issued guidelines saying that the right level of automation has to be used at all times underlining that this right level may be no automation at all.

Over the past years, MPL programmes have been running across the globe. MPL was established by the International Civil Aviation Organization (ICAO) and published under the Standards and Recommended Practices Annex 1 (Personnel Licensing) in 2006. This type of license, also adopted by the European Aviation Safety Agency, offers an alternative pathway for ab-initio student pilots to achieve the necessary competencies to act as a first officer in commercial air transportation on multi-crew airplanes. An MPL training course is specifically designed to prepare ab-initio candidate pilots to operate from the beginning as part of a crew, for a specific airplane type operated by a specific operator. The MPL syllabus places greater reliance on the use of simulation, is competency based and allows a reduction in flying hours.

What has since become apparent is that the already existent deficiencies in traditional training programmes are amplified in the MPL syllabus. There is less flying time in the aircraft, very limited solo flight time, and less exposure to the real environment. MPL was introduced to make pilot training more effective and relevant to the multicrew operational environment. Care must be taken that these principles do not produce pilots who can only function within standard operating procedures and do not possess airmanship. MPL should also not serve as excuse to cut training cost.

In 2013, ECA published its "[Pilot Training Compass: Back to the Future](#)" which provides the pilots' view on training and addresses the shortcomings in today's training syllabus. In the Compass key concepts like airmanship, striking the right balance between flight management skills and basic flying skills and training the trainer are addressed. In our analysis of MPL, we have come to the same conclusions and consider that MPL training and operations need a number of improvements.

### **2. Facts – Achievements – Deficiencies of MPL**

- MPL is a pure co-pilot license,
- MPL is the only competency-based license,

- MPL minimum requirements introduce a drastic reduction of real aircraft time,
- MPL minimum requirements allow a reduction of real solo flight hours,
- MPL minimum requirements allow a strong increase of simulated flight hours,
- There is no relevant Air Traffic Control (ATC) simulated environment available to date,
- The currently approved MPL syllabi meet the minimum requirement of 12 real landings and even less in some cases,
- Some currently approved MPL syllabi do not include real Instrument Flight Rules (IFR) flight,
- Some currently approved MPL syllabi do not include asymmetric flight in real aircraft,
- MPL syllabi introduce a global training syllabus timescale reduction, including little to no consolidation time (i.e. time to allow for reinforcing the just acquired skills,
- There is a limited sample of MPL graduates flying the line today,
- There is no proof of capability for a MPL license holder to upgrade to captaincy (no MPL trainee has graduated to Captain yet, and no requirement for Pilot in Command (PIC) task analysis),
- There is scarce/limited data feedback on the performance of MPL cadets and pilots.

#### Achievements – What worked well?

MPL programmes allow a good level of understanding of pilot's performance because they enable a better detection of possible competences that need reinforcing. When MPL syllabi are flexible to address individual competence drifts and problems this is thanks to the detailed selection of the candidates and the continuous assessment of the competences build up through training monitoring and oversight.

#### Deficiencies – What needs to be corrected?

While a careful, gradual and precautionary implementation process was encouraged when the MPL was initially introduced, the principle of a step-by-step approach was not always respected. Instead, the majority of MPL syllabi included a radical change in the split of real vs simulated hours, with a 50% reduction of real flight hours and 75 % for PIC hours. MPL syllabi also aim for total of 240 training hours, with no robust data driven rationale. A MPL syllabus matching the exact 240 minimum training hours requirement is most probably not built on a proper Competence Based Training (CBT) approach. Additionally, reducing the recommended landings from 12 down to 6 without proven data demonstrates the lack of a relevant data oversight process.

This shows that the competency-based training concept was misunderstood or misinterpreted.

Due to this lack of understanding of the competency based concept both by authorities and by Approved Training Organisation (ATOs), MPL syllabi are often only hours-based and approved as such by the authorities. This shows that authorities and other stakeholders need to receive the appropriate education on the CBT concept, its implementation, approval and oversight processes.

In addition, the limited establishment of MPL advisory boards (bringing together relevant stakeholders) inhibits proper training data collection and review.

### **3. Core philosophy of MPL training**

To address the deficiencies in the way MPL is currently used and trained for, the following 'core philosophy' should be taken as reference point:

**Safety improvement rather than cost cutting should be the primary goal in MPL syllabus design.**

**MPL training shall be an airline driven program but not ATO driven.**

**The core philosophy of training can be summarized in the following statement: Train like you fly, in order to fly like you train.**

According to ICAO Annex 19, a Safety Management System (SMS) is to be established in the ATO according to the airline's SMS safety and training objectives. This means a common set of indicators and data exchange procedures as a very basic requirement (Training Management System), using a competency element-based grading for all MPL phases with the same grading form/system.

To mitigate current deficiencies and move the MPL programmes closer to the core philosophy, MPL training programmes should improve the airmanship, basic flying skills and Crew Resource Management (CRM) skills of its candidate pilots. These issues are not new. All of them were addressed in the ECA Pilot Training Compass published in 2013. The very same concepts that ECA stressed as important for pilot training in general are important for the MPL programmes. Because of the limitations of current MPL programmes some of the concerns noted for pilot training in general are amplified in the context of MPL. ECA therefore recommends that the principles of the Pilot Training Compass are implemented into all training programs, including – and especially – in MPL syllabi. In order to assist where to focus on, a list of attention points is presented below for following subjects:

- Good practices to apply the MPL philosophy
- What is to be understood under airmanship?
- How to improve basic flying skills?
- The CRM principles that should be integral parts of successful training;
- The ATC interaction challenge;
- The training methodology and the need to train the trainers.

One area that is specific to MPL is the need to bridge the gap between the MPL license and captaincy. Training programs of most airlines in the past have selected and trained their candidates towards captaincy. Current MPL programs do not reflect this natural career path, nor do they provide the necessary tools for an evolution towards it. Current existing task analyses need to be reviewed to include captaincy. Feedback loops need to be extended to enable the assessment of the initial selection and training programmes against captaincy standards. There is not sufficient experience to ensure that the existing bridging towards the CPL licenses standard is fully met.

#### **4. Conclusion**

When MPL was introduced in 2006, it was done under following conditions:

- A strong link between the ATO and the operator for the syllabus design and follow-up, to ensure a close mutual feed-back loop and to guarantee that the training is closely adapted to the airline's specific operational environment,
- A gradual step-by-step approach for the transfer of actual flight hours to simulated hours, rather than a sudden shift, in order to allow its impact to be assessed and safety lacunae to be avoided;
- Train the trainers concept is essential, to ensure consistency with airline operating procedures, and training instructors can act as mentors
- Proof of concept, i.e. MPL achieves an equivalent or higher level of safety compared to 'traditional' pilot licenses and training programmes.

For various reasons, MPL to date has not been proven to reach the above conditions.

The step-by-step approach was not always implemented, leading to a potential lack of airmanship and basic flying skills.

Simulators are good training tools for certain aspects of the MPL course. However, many of the pilot core competencies can only be developed in a real aircraft. The limitations of synthetic training devices can create negative training. Areas such as workload management, total and unexpected threat recognition, situational awareness and real flight stress as well as certain flight conditions are impossible to simulate (G-Load Awareness, yaw, vertical air mass movement, ATC workload, post stall behaviour, beyond flight envelope).

MPL training, as currently practised, therefore needs to be improved in several areas – as outlined in this paper. Failure to do so risks creating a category of airline pilots that are trained to a sub-standard, insufficiently equipped to deal with demanding situations, and hence unable to ensure safe operations at all times.

One key element in this respect, i.e. to successfully achieve the proof of concept is to keep and promote a joint airline driven management of the MPL training, which enables the adequate safety and training data collection and management.

Since any deterioration in safety levels and further reduction in training standards is unacceptable to the pilot community, ECA will continue to closely scrutinize current and future developments of MPL programs, highlight concerns where needed, and promote improvements in pilot training towards a comprehensive Training Management System, where all stakeholders aim for a safe sustainable lifetime performance of pilots.

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**To apply the core philosophy in the MPL training context, the following good practices are strongly recommended:**

- Threat + mitigation briefing (briefing, departure, approach...dispatch, flight planning)
- Constant assessment of threats
- “Team Flights” in the real world (core/basic)
- Full Flight Simulator (FFS) is not the only “flight experience”
- Real flight time is required, for actual risk exposure (fear factor) versus virtual risk exposure (‘Nintendo’ world).
- Exposure to the unexpected :
  - in the real Aircraft → by nature and randomly (e.g simulated engine failure)
  - in the simulator → unknown scenarios (student, scripted for instructor , gradual introduction)
- “Innovative” simulator training scenarios
  - “race around the Gibraltar Rock” → handling the A/C to its limits
- Personal mentoring (e.g. peer to peer)
- Practical examples / case studies
  - Lateral thinking<sup>1</sup>
- Early structured immersion in line operation :
  - gradually, e.g. line orientation,
  - other departments (e.g. dispatch, ground ops, safety dept, etc...)
  - pairing with recurrent line pilots for LOFT
- Glider flying
- Structured self-debriefing → crew centered debriefing
- Knowledge of genesis/ development of procedures
- Repetitive training

### What is Airmanship?

- Effective flight planning
- Professionalism
  - motivation
  - mentoring
- Situational awareness
  - aware of available resources
  - environment
- Judgment
- Knowledge and transfer of knowledge into proper action
  - non-normal
  - know when not to act
  - think before acting
  - use of all means at the right time
  - apply competency in another context
- Awareness of Aircraft capabilities
  - performance
  - flight envelope
  - upset recovery
  - stalls
  - at all altitudes
- Awareness of pilot capability (define your own limits / margins)
- Retaining and adapting knowledge
- Self criticism/critic acceptance/self debriefing
- Decision making
  - when to say no
  - lateral thinking
- Stay ahead of Aircraft → anticipation → proactive actions
- Protect the available cognitive resources at all time
- Prioritize (aviate, navigate, communicate)
- Workload management
- Dealing with the unexpected
- Contingency planning (plan A,B,C....)
- Flexibility - adaptability
- Handling changing circumstances
- Know and respect procedures

Lack of Airmanship is already a recognized issue for pilots with significant flight experience.

Airmanship cannot be trained but educated by airmen and thus requires time to develop adequately.

Considering the present implementation status of MPL, and the massive transfer of training time to a virtual environment, ECA proposes to promote in particular the following areas to improve Airmanship of pilots, and especially of the MPL trainees:

- Situational awareness
- Judgment and decision making
- Assessment of own skill capability / aircraft capability

### **Basic Flying skills**

With Loss of Control in Flight being one of the hot safety topics, any further deterioration in the Basic Flying Skills of pilots is unacceptable.

ECA therefore recommends to emphasise the following aspects:

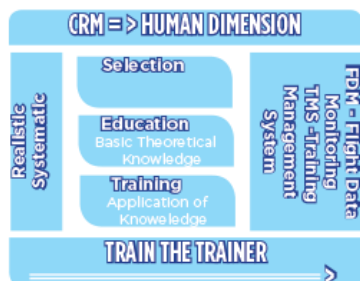
a) The relevant devices for each phase shall be determined according to the MPL Task Analysis.  
b) Whereas the final competency level is determined by the airline, the expertise of the ATO is required to determine the best training opportunities.

- Transition from Stick and Rudder to Trajectory & Energy (Pitch & Power) flying, according to Phase and Device.
- Energy Management in Aircraft and/or FFS  
For example: WX, Top of Descent, ATC, Fuel Efficiency, Short Cuts
- Instrument scan differences:  
PF& PM: VMC / IMC / Automated flight / Manual flight / Raw Data
- Upset recovery training ( prevention, recognition and recovery )  
In Aircraft & Full Flight Simulator, G-Awareness Device recommended.
- Upside down & Spin  
Experience & recover from it, in Aircraft
- CDFA (continuous descent final approach) non precision approach,
- STAC (Stabilized Approach Concept)
- Training for a high performance transport aircraft, ( Basic Jet or Turbo Prop Training )  
In Aircraft & Full Flight Simulator  
For example, but not limiting to: associated aerodynamics and performance, rudder control, engine spool up time, low speed vs. high speed swept wing characteristics
  - IFR flight in aircraft
  - Asymmetric IFR flight in aircraft

### **Crew Resource Management (CRM) → “Human Dimension”**

The following CRM principles are integral parts of successful training:

- Train Trainers First
- Basic Understanding is delivered in Class Room
- CRM / HF (Human Factors) is delivered through the whole course,
- Non-punitive environment, including the use of recorded sessions



As a general statement, training must be :

- Realistic (achievable)
- Systematic : one needs to go through the following phases :
  - Selection
  - Education : “Basic Theoretical Knowledge”
  - Training : “Application of Knowledge”

Training must rely on robust processes:

- FDM (flight data monitoring) etc...
- TMS (training management system)

Tailored instruction based on gap analysis / previous evaluation:





**Interaction with ATC**

Phraseology should be applied according to existing standards :

- Basic Knowledge (Doc 4444)
- Level 4 (ICAO)

However, quality of communication depends also on the capacity of interacting appropriately.

As stated above, there is no relevant simulated ATC environment available to date.

Proper ATC interaction in normal operations context, including busy airspace, task interruption management and changes in the workload can be delivered only through real world exposure.

Furthermore, additional classroom and simulator training has to be provided in order to prepare for abnormal operations, including worst case scenarios, and ATC TEM.

**Training Methodology:****1. Training the trainers:**

A consistent training programme requires the Trainers and Check Airmen/Examiners to be trained to the airline standards.

A number of Line Pilots from the airline shall be involved in the training at the ATO :

- To enhance the training feedback from the ATO to the Airline (better training oversight/monitoring)
- To improve the training syllabus and make it better oriented towards line operations.

Flying skills are developed through training. Which means:

- Real life is full of training opportunities, and a proficient trainer should be able to use them.
- Just flying the line is also good training (knowledge consolidation, trainee self-esteem buildup, trainee workload/hassle management), and a proficient trainer should be able to recognize this need.

Airmanship is acquired through education and mentorship:

- Training Instructors to be also educators
- Train the trainers for being mentors

**2. Classroom training / education**

- Peer-to-peer and airmen exchanges
- Case study analysis
- Threat and Error Management exercise
- Exercises in CRM training / class room training
- Knowledge of development of procedures

**3. Simulator training missions**

- Briefing / Debriefing
- Systematic threat recognition and error mitigation
- Exposure to unexpected situations
- Innovative training scenarios to promote lateral thinking
- Structured self-debriefing / crew centered debriefing
- Repetitive training up to skill level to train under a variety of conditions

**4. Aircraft training missions**

- Briefing / debriefing
- Systematic threat recognition and error mitigation
- Exposure to unexpected situations
- Innovative training scenarios to promote lateral thinking
- Observer flights on the line ops by the Airline in early phases of MPL training
- Team flights
- Structured self-debriefing / crew centered debriefing
- Repetitive training up to skill level to train under a variety of conditions