



IATA Training and Qualification Initiative (ITQI)

Report 2009 – Fall Edition



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1. FOREWORD

Dear Readers,

I'm pleased to present to you the autumn edition of the IATA Training and Qualification Initiative (ITQI) report.

The ITQI project began in 2007 under the guidance and support of the IATA Board of Governors and Operations Committee (OPC), with the objective to secure the aviation industry's need for the next generation of licensed professionals.

This third ITQI report continues to offer the original background material but also demonstrates how the initiative has been refocused to match industry needs since inception.



Over the past 60 years, the core strength of IATA has been our proven track record of enhancing aviation safety around the world. In this time, the regulation of training has not adapted to meet modern safety needs. There is a wealth of compelling evidence that human factors are the most likely causative elements in commercial aviation accidents today.

Through new programs such as the Multi-Crew Pilot License (MPL) training program and Evidence-based Training (EBT), the ITQI project is striving to dramatically shift the emphasis of training and improve safety by focusing on a competency-based approach, in addition to mitigating real risks and addressing the threats faced in everyday operations.

The industry remains under pressure from reduced passenger and cargo traffic. With airlines necessarily focused on protecting and improving revenue with dwindling load factors, the ITQI program is focused on mid to long-term goals and we strongly believe that this is still a crucial time to continue working to secure that the most capable next generation of professionals are attracted to and effectively trained within the industry.

A continued team effort and collaboration with ICAO, major National Aviation Authorities, OEMs, IFALPA and IBAC as well as governmental bodies is crucial to the success of this initiative. I would like to thank all partners and industry specialists for their contribution to ITQI in particular to Nancy Graham (ICAO), Patrick Goudou (EASA), Randy Babbitt (FAA) and Martin Eley (Transport Canada).

Best Regards,

Guenther Matschnigg

Senior Vice President, Safety, Operations and Infrastructure

2. EXECUTIVE SUMMARY

The IATA Training and Qualification Initiative (ITQI) was created to address the critical need for qualified pilots and aircraft maintenance personnel both mid and long-term. Despite the current economic crisis, this requirement and the need to improve safety and efficiency during expansion are still the primary targets. The developed solutions will be targeted to meet safety objectives. The resulting focused approach is likely to yield efficiencies over the medium term. In addition, there is an acute need for harmonized implementation in all regions.

IATA has been actively attaining information from the aviation industry through forums, briefings and expositions. The ITQI team has been engaged in many endeavors with several partners including, the International Civil Aviation Organization (ICAO), the Federal Aviation Administration (FAA), the European Aviation Safety Agency (EASA), Transport Canada (TC), Civil Aviation Administration of China (CAAC) Original Equipment Manufacturers (OEMs) and the International Federation of Airline Pilots Association (IFALPA).

A progress report has been submitted to the IATA Operations Committee (OPC) on a regular basis and their feedback provided the necessary guidance and support for the initiative.

The goals of ITQI are to:

- Increase the resource pool by identifying means to improve industry attractiveness
- Improve effectiveness of qualification schemes by developing and introducing competency-based training
- Increase global market permeability by ensuring harmonized implementation

The successful cooperation between IATA and its partners has enabled extensive progress to be made within the program including:

- Market survey report completed (see ITQI Spring Report)
- Outlines of guidance material developed
- Assessment of efficiency potentials launched
- Publication of IATA Flight Simulation Training Device Data document version 7

The following actions are now required:

- Align training concept, including EBT to ensure support by key regulatory bodies (FAA, EASA, TC)
- Finalize and Validate Efficiency Matrixes
- Complete Guideline Material as agreed with ICAO
- Monitor and support MPL implementation
- Increase Industry and Government Awareness

➤ **ITQI Awareness Program**

Major efforts have been made to increase the awareness of the need for more efficient training concepts and harmonized implementation globally. IATA's proposed initiatives have been well received at all key industry events in 2009.

ICAO in partnership with IATA organized a roundtable with key industry stakeholders in May 2009 and will continue to advocate the issues concerning the Next Generation of Aviation Professionals.

IATA has engaged the major regulatory bodies, EASA, FAA and Transport Canada, who are now active participants in the work, in order to coordinate a multilateral approach to training and qualification needs of licensed personnel.

Flight Crew Training and Operations

➤ **Development and Implementation of Competency-Based Training**

○ Evidence-Based Training

Progress in the design and reliability of modern aircraft has prompted an industry review of pilot training and checking requirements. In addition to the wealth of accident and incident reports, flight data collection and analysis offers the possibility to tailor training programmes to meet real risks. The aim is to identify and train the real skills required to operate, whilst addressing any threats presented by the evidence collected. The IATA best practice document will facilitate regulatory change and enable more efficient and safety driven training. The ICAO Procedures of Air Navigation Services Training (PANS-TRG) document 9868 will be updated accordingly with applicability targeted for Q3 2011.

○ Instructor Qualification

One of the cornerstones in any educational system is the instructor base. In our industry, this foundation is being challenged for a number of reasons. IATA has therefore developed a new strategy and concept for instructor qualification standards. This is now being evolved further to encompass the training and standards for evaluators. The PANS-TRG will be updated accordingly with applicability targeted for Q3 2011.

- Multi-crew Pilot License (MPL)

The concepts and implementation of competency-based training have once again moved forward. Since the last report the number of States embracing the MPL concept through regulations and support for specific training courses has increased to 22. 50 pilots have successfully graduated from MPL courses and are flying. 400 students have started MPL training and expect to be checked out over next 2 years. The ITQI Awareness Program will continue to promote the understanding and support national implementation. Please refer to Appendix A for our new MPL FAQ.

➤ **Pilot Selection Industry Survey**

ITQI has undertaken a pilot selection survey in order to create a Best Practices Manual. The survey has been launched and the data is presently being evaluated. A first draft aims to be ready by the end of 2009.

➤ **Simulator Standards**

IATA has published the 7th Edition of the IATA Flight Simulation Training Device Design and Performance Data Requirements document. This document has been accepted as the industry standard by manufactures, purchasers and flight simulator users for over three decades. The 7th edition will reflect the requirements for flight simulators taking into account modern aircraft system technologies and flight operation procedures to design most efficient flight training devices.

The related ICAO document which provides the necessary regulatory framework has been completed. Work will continue to develop new guidance material for the cost effective distribution of data required to manufacture a flight simulator according to the new standards. IATA will continue to work with all industry stakeholders to evaluate solutions for an agreement on data ownership in order to mitigate the risk for significant cost increases.

Engineering and Maintenance

➤ **Development and Implementation of Competency-Based Training**

The newly developed training concept results in a more effective career path. This concept is based on a competency framework that defines the various training elements and their practical implementation supported by a continuous learner assessment. The new guidance material being developed by IATA is planned for completion by the end of 2009. It will address this new and efficient training methodology.

IATA has been working closely with key industry stakeholders and ICAO to introduce a new chapter into the PANS TRG with applicability by mid 2011.

3. BACKGROUND

In December 2007, IATA's Board of Governors asked IATA to conduct a review of airline industry training needs for licensed personnel (pilots, mechanics and engineers, etc.) and to develop recommendations for meeting these needs without compromising quality.

Q1-Q2 2008

In Q2 2008, IATA reviewed projections from four major aircraft manufacturers on deliveries for all commercial aircraft categories (see Chapter 11 – References).

Up to 30% of the new aircraft were expected to replace older aircraft. Based on this number, the global industry fleet was projected to expand by up to 12,350 aircraft by 2018. The then current order backlog consisted of more than 7,000 firm aircraft orders and 2,300 options. It had been reported however, that a number of airlines were considering delaying the delivery of aircraft due to the shortage of skilled staff.

Q3 2008-Q1 2009

The manufacturers fleet forecast remain inherently unchanged. However, the following issues have been recognized by IATA:

- The gap between pilot demand and training capacity differs significantly by region due to the demand in emerging markets generated by stronger traffic growth and insufficient local training capacity.
- The IATA Operational Safety Audit (IOSA) provides a platform to identify those trends through the established programmes in Flight Operations and Engineering & Maintenance.

Q2-Q3 2009

- The current economic situation as of Q3 2009 still offers a reprieve in short-term needs. However, based on long-term aircraft orders, IATA projects that previously estimated long-term planning requirements of licensed personnel still exists.
- IATA is monitoring the effects on safety, namely by observing new trends in deviating training standards and experience levels.

For more information on the above, please contact the ITQI team at itqi@iata.org.

4. ITQI AWARENESS PROGRAMME

Regulatory Agencies are key stakeholders in the ITQI programmes and are involved at many of the working group levels. ICAO staff have been involved in the ITQI Core Project Team from the beginning. As well as this on-going interaction the following planned visits have taken place.

- **Regulatory Authority Meetings and Discussion**
 - **Transport Canada - Ottawa Feb 12, 2009**
 - **EASA/AEA – Paris Mar 3, 2009**
 - **FAA – Washington Mar 17, 2009**
 - **CAAC – Beijing Mar 23, 2009**
 - **CAAC – Beijing May 14, 2009**
 - **FAA – Washington July 14, 2009**
 - **FAA – Washington Oct 1 & 6, 2009**

The project team has advocated and promoted ITQI in key industry events around the world, promoting the various tasks within the initiative as well raising awareness for the program. These events include:

- **World Airline Training Symposium (WATS) - Orlando, USA**
- **Asia Pacific Aviation Training Symposium (APATS) - Hong Kong, China**
- **ITQI (Evidence Based Training Workshop) – Hong Kong, China**
- **European Airline Training Symposium (EATS) - Prague, Czech Republic**

These industry training events during 2009 are providing a good platform for the ITQI team to update the regions' airlines, National Aviation Authorities (NAA), training providers and pilot associations on new developments in civil aviation training.

At each event, participants were informed about ITQI in general. Certain specific areas such as "evidence-based training" and "harmonized implementation of MPL" were presented in greater depth and were very well received.

- **ICAO Next Generation of Aviation Professionals (NGAP)**

ICAO in partnership with IATA is working towards a symposium for the Next Generation of Aviation Professionals in March 2010. The initial kickoff for this was a roundtable forum in May and will continue with the 3 working groups meeting in October.

- **Royal Aeronautical Society (RAeS) Simulation Conference - London, England**

The Evidence Based Training concept will be presented at the annual conference in November, for the purpose of FSTD manufacturer awareness of potential changes in training needs affecting the design of new products.

➤ **RAeS Annual International Flight Crew Training Conference**

Key deliverables of ITQI were presented, more specifically on evidence-based training. This was well received with additional airlines and training organizations volunteering to join the group.

➤ **Airbus Training Seminars – Beijing, Mexico City, Tunis**

ITQI has and is being presented at these meetings, with particular focus on evidence-based training and MPL in all three seminars.

The exchanges were very positive and bilateral talks about approval details were initiated. A follow-up meeting will take place in 2009.

➤ **MPL Implementation Support**

- Jan 09: Meeting with Egypt Air, E-CAA and the Egyptian Flight Training Academy in Cairo
- Mar 09: Meeting with Air France Training Management in Paris
- Jun 09: Meeting with JetStream, a JAA approved Greek Flight Training Organization (FTO) in Athens

➤ **Further awareness events during 2009**

- 19/20 Feb.09: Panel discussion at a Thales industry event in London
- 02/04 Jun 09: Europe/US International Aviation Safety Conference in Athens
- 20 Oct 09: EASA MPL Review Board, Cologne

➤ **Upcoming Events**

- 10/11 Nov 09: EATS, Prague
- 11 Nov 09, EASA, Cologne
- 13 Nov 09, European Commission, Brussels
- 18/19 Nov 09: RAeS Simulator Conference, London
- 24 Nov 09: EASA International Pilot Training Conference, Cologne
- 30 Nov 09: Crew Management Conference, London

5. ASSESSMENT OF EFFICIENCY POTENTIAL

Verification of the beneficial effects that would be gained by implementing certain ITQI actions within the training area of pilots and licensed maintenance personnel is on-going. The project will require more feedback in order to present a more accurate assessment. The information that was published in the Spring edition is offered again to highlight the areas of potential benefit.

This study intends to include a matrix that will highlight the efficiencies to be gained, with a percentage prediction for each activity as a result of the action. The actions, selected for the grid, are core to the ITQI program or have been initiated within it. The evaluations, so far, have included the following **actions**:

Pilot Actions	Mechanic/Engineer Actions
↗ Implementation of competency based training	↗ Harmonization of regulatory license privileges
↗ Implementation of MPL	↗ Standardizing training programmes
↗ Implementation of distance learning on payroll	↗ Use of standard training documentation
↗ Implementation of distance learning off payroll	↗ Reviewing personnel selection criteria
↗ Harmonization of training programmes	↗ Implementation of competency-based training
↗ Harmonization of regulations	↗ Implementation of competency-based examination/assessment requirements
↗ Use OEMs' standard manuals	↗ Increased use of computer based training
↗ Better usage of lower-level training devices	↗ Implementation of specific simulation devices
↗ Implementation of zero flight-time training	↗ Implement the use of virtual reality in training and assessment
↗ Adopting AQP	↗ E-learning /distance learning off the payroll
↗ Reviewing selection criteria	↗ E-learning /distance learning on the payroll
	↗ Incorporate training material established from evidence-based data

The areas or types of training, covered for the two different groups differ. For pilot training we have defined four specific areas to be evaluated. The four **areas** are:

- ↗ Ab Initio training
- ↗ Type training
- ↗ Conversion training
- ↗ Recurrent training

In the training for mechanics/engineers, seven specific areas are to be evaluated. The **areas** are:

- ↗ Basic / Fundamentals Competencies-Aircraft Systems Maintenance
- ↗ Basic / Fundamentals Competencies-Aircraft Structures Maintenance
- ↗ Basic / Fundamentals Competencies-Component Maintenance
- ↗ Type Rated Competencies-Aircraft Systems Maintenance
- ↗ Type Rated Competencies-Aircraft Structures Maintenance
- ↗ Type Rated Competencies-Component Maintenance
- ↗ Recurrent Training

Within each area, a list of activities or topics have been identified that can be impacted by the implementation of the defined actions. For both pilot training and mechanic/engineer training, the following **activities** are to be assessed:

↗ Instructors	↗ Aircraft investment
↗ Aircraft utilization non-fuel costs	↗ Aircraft utilization fuel costs
↗ Full flight simulator investment (capital)	↗ Full flight simulator utilization (operation)
↗ Training devices (CBT up to FTD)	↗ Infrastructure/facilities
↗ Administrative costs	↗ Running costs
↗ Distance learning - on payroll	↗ Distance learning - off payroll
↗ On-line productivity loss	

An efficiency benefit discussion and evaluation is taking place within the ITQI core project team for each action item. The process will be similar for both groups, and include the defining and setting of predictions and prerequisites, in order to conclude an estimated percentage benefit for each activity. This percentage will be predicted as a result of changing from current training operations to implementation of the action. The preliminary indications from the pilot evaluation, and the initial discussions for maintenance and engineering within ITQI, clearly suggest that there are substantial efficiency potentials connected to the defined actions within many areas when implemented. The total

percentage value resulting from the grid will have to go through a calibration before it can be used as a vehicle to enable defining of monetary values for the savings.



However, the percentage emerging from the grid on the individual actions as well as on the total, conclude beyond doubt, that there are considerable saving/efficiency potentials. There should be similar trends within the maintenance/engineering training. The ITQI project team continues to work on the calibration of the values obtained from the operation grid.

In order to verify some of the assumptions put forward in both the pilot and the maintenance/engineering study, and to further refine the percentage benefits the ITQI team will be seeking assistance from airline training staff.

FLIGHT OPERATIONS PERSONNEL

6. DEVELOPMENT AND IMPLEMENTATION OF COMPETENCY-BASED TRAINING

6.1 Evidence-based Training

Background

For decades, the content of flight crew training programmes has remained unchanged according to regulation whilst aircraft design and reliability have evolved dramatically. Regulatory prescriptions for flight crew training and checking are based on events, which are now highly improbable in aircraft designed to meet modern standards. Training programmes are consequently burdened with items, which do little to mitigate real risks or enhance safety.

In 2005, ICAO adopted an international standard for the collection and analysis of flight data. Today, the industry has a wealth of safety related evidence at its disposal, from accident and incident reports, LOSA, safety auditing and Flight Data Monitoring programmes. By analyzing this evidence, we have an opportunity to influence and advance the philosophy of flight crew training, by weighing risks and looking at those situations, which are more likely to happen.

Safety Benefit

There are indications that the global accident rates are beginning to rise. Effective training is a cornerstone of any safety improvement program, and by targeting real risks we can deliver more effective training within a cost structure similar to today. It is clear that not enough has been done to address human factors related issues, which are still the primary cause of the majority of serious incidents and accidents.

The aim of the group is to:

Develop a new paradigm for competency based training and evaluation of airline pilots based on evidence

Development

The following tasks have been completed:

- A new matrix of pilot competencies, being combinations of knowledge, skill and attitude, in addition to measurable performance criteria.
- An intuitive risk analysis providing the basis for the development of effective training and evaluation programs. This matrix is developed but will be extended to cover all fleets in commercial operation with more than 40 seats.
- Prioritized guidance for the construction of training and evaluation events to be used as a vehicle to evaluate and develop pilot competency. The framework has been completed in addition to specific examples to be used in beta test programs in 2010

The following tasks are in progress

- Example contents for training programmes to meet fleet and/or operation - specific training needs
- Guidance for airline implementation of evidence-based programmes
- Evidence based training and evaluation beta testing with nominated authorities and airlines. To-date 4 airlines have been identified and work is in progress for 2010.



Picture courtesy of Airbus / CAT Magazine
DC3 cockpit superimposed on an A380

- Evaluation of the risk matrix with collected data. Over 30 airlines are contributing flight data. In addition to substantial amounts of incident, accident and LOSA data this will be used to validate the risk analysis already conducted.
- Draft amendment to ICAO Doc 9868 PANS-TRG encompassing the framework of EBT
- Draft ICAO Manual of EBT
- Adoption of EBT by NAAs worldwide

All major National Aviation Authorities have been involved or consulted, in order to facilitate efficient regulatory change once new programs have been demonstrated.

Feedback and measures of success

The measure of success in training would be to mitigate or reduce the evidence of foreseen events can be measured (e.g., reducing the number of de-stabilized approaches quantified by flight data).

Success in providing solutions to deal with unforeseen events can have a similar benefit in reducing serious or catastrophic consequences.

Conclusions

If we fail to make a substantial change to the philosophy of airline pilot training, we will face an increasing gap between training and reality. It is time to create an effective bridge between safety data and the development of training solutions. At the same time, we must embed robust methodologies for the handling of real events and the development of key pilot skills, both technical and non-technical, into those training solutions.

6.2 Instructor Qualification

Background

The success of any training program depends on the competence of its instructors. Similar to the development of a competency-based approach to training, instructors should be selected, trained and assessed according to a defined competency framework.

This activity was initiated to provide a consistent basis for the accreditation of instructors involved in all phases of training for the Multi Crew Pilot License (IATA Global MPL Initiative) as a precursor to ITQI. In times of expansion there is pressure to reduce experience requirements to meet airline demand, and without an alternative competency based strategy to ensure trainer effectiveness this leads to risks. The task now has a more general focus.



Picture courtesy of Airbus

Objective

To develop and enhance global practice for the training and standardization of licensed and authorized personnel required for the training and evaluation of flight crew members.

Development Work Completed

- A comparative study of the regulatory standards for instructor training and qualification between major contracting state authorities
- Identification of competency and outcome driven best practice approaches to instructor training and qualification
- Development of a global best practice document with the potential for future adoption in ICAO PANS-TRG to include the following:
 - Definition of instructor roles
 - Pre-requisites for instructor qualification
 - Instructor competencies for each defined role
 - Methodology for the assessment of competence

Outstanding Development Work

- Development of new methodologies and instructor/evaluator training to support the concept of Evidence Based Training, in particular the provision of adaptation training guidance for the existing instructor/evaluator population
- Outline framework in the methods to be employed and content of instructor/evaluator training programs generally.

6.3 Multi-crew Pilot License (MPL)

Background

With the publication of redesigned training standards in November 2006, ICAO paved the way for the global introduction of competency-based training. This has allowed for the acquisition of a license to operate a multi-crew transport airplane. Supported by a job task analysis, this outcome-based instructional system concentrates on multi-crew cooperation from the very beginning of a pilots ab-initio training.

Training in small, single pilot aeroplanes is substantially reduced and substituted by the use of modern flight simulation training devices for scenario-based training in a multi crew airline operation environment.

By emphasizing the overarching principle of Threat and Error Management (TEM), the MPL training considers the fact that the vast majority of incidents and accidents in civil aviation are caused by a lack of interpersonal skills (communication, leadership, teamwork, workload management, situational awareness and structured decision making).

The MPL considers the threats inherent to increased automation and reduced manual flying thus improving training quality and therefore operational safety. It also has a positive environmental impact by reducing actual aircraft time by 50%.

MPL Awareness

During events such as those described in chapter 6, the ITQI Awareness program has been used by the MPL Go-Team to continue to inform and educate the training community on this modern approach to ab-initio airline pilot training.

Nevertheless, there are still substantial threats to be managed. In this context, there is a lack of knowledge, misunderstandings and misinterpretations of the MPL principles around the world.

Another mechanism being used to enhance the clear understanding of the MPL program is an MPL FAQ that will be posted on the IATA website. A copy of the document that will soon be available is presented in Annex 1.

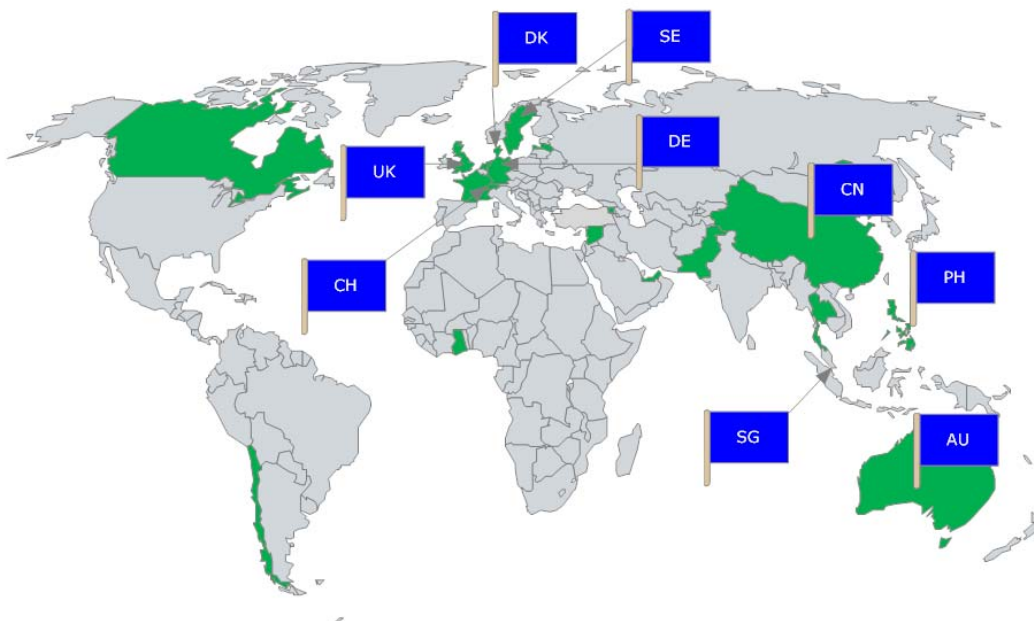


MPL around the world

The map below depicts the countries that have:

- (In green) the MPL license implemented in the national regulations (based on feedback to the ICAO State Letter AN 12/50-07/37 sent on 7 December 2007):
 - Armenia, Australia, Canada, Chile, China, Denmark, France, Germany, Ghana, Latvia, Maldives, Netherlands, Pakistan, Philippines, Sweden, Switzerland, Syrian Arab Republic, Thailand, UAE, United Kingdom
- (Blue flags) MPL courses in progress:
 - Australia, China, Denmark, Germany, Philippines, Sweden, Switzerland, and United Kingdom

Swiss is currently operating A320s with MPL graduates.



In 2015 it is intended to have the majority of the world's ab-initio airline co-pilots trained through the MPL curriculum.

7. PILOT SELECTION

Market surveys are one of the best indicators of current situations and their interpretations assist in developing strategies for the future. In the Spring Edition of the ITQI report, IATA reviewed the aircraft manufactures' outlook (published in 2008) and the industry response to the ICAO State Letter- June 2008. As well, an extensive synopsis of the IATA industry survey conducted in the autumn of 2008, as the current economic crisis was taking form, was published.

In this edition ITQI has continued to probe the industry for data, this time regarding pilot selection. This latest IATA survey was launched on June 11, 2009 and closed on August 5 after an extension of approximately 2 weeks. The survey consisted of 91 questions and was divided into 3 parts

- Organization- Training- Hiring
- Financial Aspects
- Psychology-Methodology

Considering the complexity of this topic and the survey-content, which required in-depth background data from various participants of the selection process, the results were good. The data is presently being evaluated and the final results will not be available until after this document is published. However, sample questions have been included here to offer a sense of the survey.

Organization- Training- Hiring

Which kind of personnel are you employing/recruiting?

1. Ab-Initio
2. Ready entry (low experience) Define:"low experience"
3. FO's
4. Capt's
5. Ready entry (low experience) Define:"low experience"

What actions do you take to ensure a sufficient number of applicants (several answers are allowed)?

1. Advertise in general newspapers
2. Advertisement in specialized aeronautical publications
3. Homepage
4. Personal contacts of staff to potential applicants
5. Organized meetings with schools/companies
6. Nothing. It works by itself.

Financial Aspect

What are the costs of your selection per candidate and group?

Responses to this question were made based on the kind of personnel being hired and whether or not this process was out-sourced or accomplished in-house.

How much does the candidate contribute towards the costs of training? (US\$ per candidate/group)

These responses were solely dollar figures.

Psychology-Methodology

What do you consider the strengths of your selection system (several answers possible)?

1. Economy in time
2. Economy in costs
3. No. of successful candidates with regard to later career phases
4. Results of empirical evaluation
5. High reliability
6. High validity
7. Quality of the evaluation procedure
8. Degree of automation
9. Combination of tests
10. Flexibility for different groups
11. Requirements for test-operator qualification
12. Other strengths, please describe.

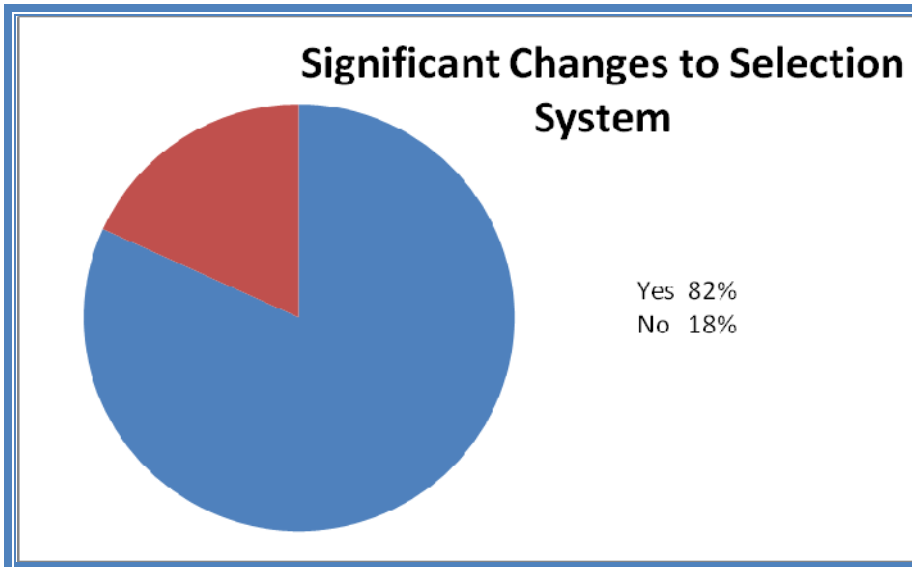
Which types of selection instruments do you use for the different groups (several categories possible)?

For each of the 4 groups of candidates (Ab-Initio, Ready Entry, FO's & Capt's) the following selection instruments were offered-

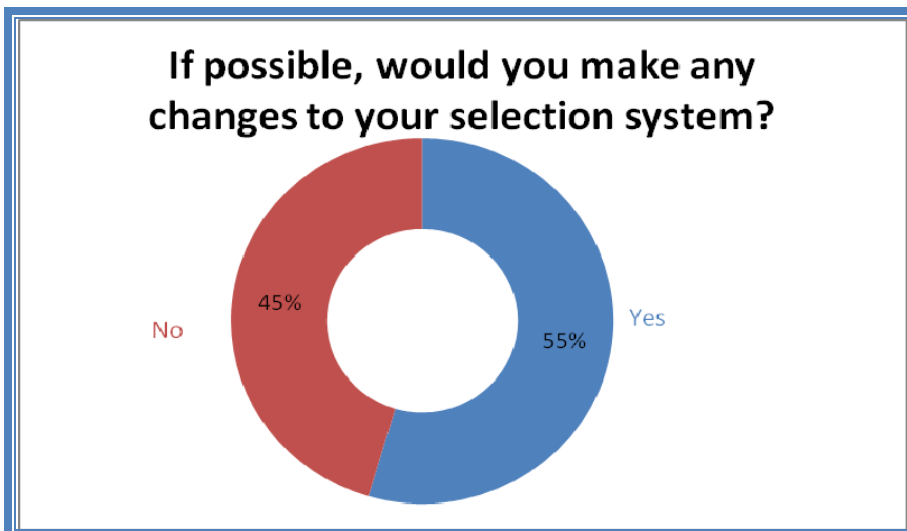
1. Questionnaires
2. Free style interviews
3. Semi standardized interviews
4. Group scenario for social abilities (CRM)
5. Psychometric paper pencil tests
6. Psychometric apparatus tests
7. PC based psychometric tests
8. Simulation based work samples
9. Simulator based psychometric tests
10. Fixed base simulator
11. Full flight simulator
12. Other instruments? If "yes", please describe!

Some very preliminary data is available and is shown here in graphical format.

This first graph is the response to the question “Did you make significant changes to your selection system in the past?”



Clearly, the vast majority of the respondents have made significant changes to the way they conduct their selection of candidates.



Although not as overwhelming as the previous graph, the majority of the respondents would make changes to their selection system if they could.

The ITQI working group responsible for the evaluation of the data will be producing a Best Practices Manual. Considering the presentation in these two graphs alone, the systems used for the selection of pilots have been changing and will continue to change. The guidance offered through a Best Practices Manual will be invaluable for IATA members.

8. FLIGHT SIMULATOR TRAINING DEVICE STANDARDS

Status

The standardization efforts for Flight Simulator Training Devices (FSTD) have resulted in:

- Finalization of the new ICAO classification of FSTDs and their associated qualification criteria (RAeS IWG recommendations for edition 3 of ICAO Manual 9625). IATA consultants participated in the IWG Steering Group and acted as the Training Subgroup Chair. The new ICAO Doc 9625 ed.3 Vol.1 (airplane) was published by ICAO on 31.July 2009.
- IATA has published the Flight Simulation Training Device Design and Performance Data Requirements, Edition 7 and is now available for purchase from the IATA online store:

<https://www.iataonline.com/Store/default.htm>



First published in 1980, this updated version details the airplane data requirements for the design and construction of Flight Simulation Training Devices (FSTDs).

Such data are necessary to ensure that the FSTD represents the actual airplane, throughout its certified flight envelope.

An essential guide for airlines, FSTD vendors and airplane manufacturers, including sub-contractors of airplane ancillary equipment such as automatic flight control and flight management systems.”

ENGINEERING AND MAINTENANCE PERSONNEL

9. TRAINING CONCEPT FOR LICENSED PERSONNEL IN AIRCRAFT MAINTENANCE

Background

To ensure the quality and safe performance in aircraft maintenance, the personnel involved are required to demonstrate competencies. This demonstration is required in order to issue licenses and authorizations.

The procedures and requirements for the issue of licenses are stipulated in the Airworthiness Requirements of the various States, based on ICAO Annex 1 – Personnel Licensing.

Each State (or group of States) has developed its own set of regulations, which deal with personnel in aircraft maintenance. These regulations are presently not harmonized. This limits the employment and exchange of maintenance personnel across borders.



In most States, the examination required to obtain an Aircraft Maintenance Basic / Fundamentals License, is focused on the knowledge of the candidates rather than on their competencies. To ensure a certain degree of hands on experience, the authorities stipulate requirements for time spent in aircraft maintenance before a license is issued.

The next step in a typical career path is to obtain equipment type ratings. This is normally done through attendance of Approved Type Rated Courses. Once successfully completed, a knowledge examination and related hands on experience on the type of equipment are required. The duration of the hands on experience varies from State to State. If the requirements set by the various authorities have been met, a type endorsement is appended to the Aircraft Maintenance License. In most States, this is a pre-requisite to the granting of an Aircraft Maintenance Authorization issued by those Approved Maintenance Organizations in which the person is employed.

This type of authorization grants the individual privileges to work on the equipment and be responsible for the issuance of Certificates of Release to Service.

Proposed System

The proposed system is centered on competency-based training and assessment. Such a system requires the definition of competencies that a person has to demonstrate, in accordance with agreed upon standards, to be eligible for a particular license.

To achieve this, trainees have to attend approved, closely supervised, systematic and continuous courses of training, in which knowledge and skills training are linked and

coordinated in order to ensure optimum learning transfer. This approach allows for the use of multiple instructional methods including distance learning, when the course material is approved and embedded in the practical training. Such training requires defined entry levels, approved programmes and intermediate and final knowledge examinations and skill assessments.

The same principle applies to Type Rated Training.

Due to the complexity and diversity of the tasks in the aircraft maintenance world, it has been determined that three distinct sets of competencies will have to be developed. As a result, the competency frameworks for aircraft mechanic (both base and line), component repair and structural repair have been prepared.

The advantage of a competency-based approach is that the overall training and experience time requirement can be shortened and standardized, in accordance with pre-defined competencies, thereby leading to standardized licenses.

Each maintenance organization can apply this competency-based approach in accordance with its context and internal policies and should be documented in the Maintenance Organization Handbooks/Expositions, which are a pre-requisite for the company's approval by the authorities.

10. GLOSSARY

When the following terms are used in this document, they have the following meanings:

AQP. Advanced Qualification Program

ATO. Aviation Training Organization

CBT. Competency-based Training

Competency. A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard under a certain condition.

CAAC. Civil Aviation Administration of China

Competency-based training and assessment. Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

Competency element. An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.

Competency unit. A discrete function consisting of a number of competency elements.

EASA. European Aviation Safety Agency

Error. An action or inaction by the flight crew that leads to deviations from organizational or flight crew intentions or expectations.

FAA. Federal Aviation Administration

FSF. Flight Safety Foundation

FSTD. Flight Simulator Training Devices

IATA. International Air Transport Association

IBAC. International Business Aviation Council

ICAO. International Civil Aviation Organization

ICFQ. International Committee for FSTD Qualification

IOSA. IATA Operational Safety Audit

Level D FFS. Level D Full Flight Simulator

LOSA. Line Operating Safety Audit

MPL. Multi-crew pilot license

MTO. Maintenance Training Organization

PANS-TRG. Procedures of Air Navigation Services Training

Performance criteria. Simple, evaluative statements on the required outcome of the competency element and a description of the criteria used to judge whether the required level of performance has been achieved.

SARPs. Standards and Recommended Practices

TC. Transport Canada

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12. APPENDIX A – MPL FAQ

FREQUENT ASKED QUESTIONS ON MULTI-CREW PILOT LICENSE (MPL)

1. Why MPL?

By adopting new standards and recommendations for ab-initio airline pilot training in November 2006 ICAO cleared the way for a substantial modernization of this type of training. Now best industry practice can be applied by making use of modern Instructional System Design (ISD) and the latest developments of Flight Simulation Training Devices (FSTD).

The MPL training scheme concentrates on the core competencies of pilots of modern jet transport airplane emphasizing the aspect of multi-crew operation from the early stages of the training.

It prioritizes the overarching principle of Threat and Error Management (TEM) considering the fact that the vast majority of incidents and accidents in civil aviation are caused by a lack of interpersonal skills (communication, leadership and teamwork, workload management, situational awareness and structured decision making).

Although this new approach to ab-initio pilot training is NOT driven by economic aspects, the outcome based focus will result in the reduction of training time thus leading to higher efficiency. The obvious improvement of the training quality will lead to improved safety standards in cockpit operation.

Compared to current ab-initio airline pilot training the MPL scheme shifts a substantial part of training from real airplane into Flight Simulation Training Devices (FSTD) hence reducing CO2 emissions, noise and airspace congestion.

The MPL is a contribution to the ongoing effort to preserve and improve the safety standard of civil aviation cockpit operation in view of the doubling of its volume within the next two decades.

Through PANS TRG (Doc. 9868) the MPL is the best documented training system in the long history of ICAO Annex 1.

2. Where can the governing rules and guidance material for MPL be found?

- a) In ICAO Annex 1 Chapter 2.5 plus Appendix 3 and Attachment B as well as in ICAO Doc. 9868 “PANS TRG”
- b) In JAR-FCL Amendment 7, Section 1, Subpart K, 1.500-1.535 plus Appendix 1 to 1.520 & 1.525 (which refers to all other relevant Subparts in Section 1 and the relevant additional guidance material in Section 2). For MPL Instructors see Section 1, Subpart H, 1.310 (d) plus Appendix 1 to 1.310 (d) (which leads to further guidance material in Section 2)
- c) In the National Aviation Regulations for:
 - Australia (draft status)
 - Canada (draft status)
 - China
 - Hong Kong
 - Jordan (draft status)
 - Philippines
 - Singapore (draft status)
 - Thailand
 - UAE

3. What is competency?

A combination of skills, knowledge and attitude required to perform a task to the prescribed standard.

4. What is Competency-based training and assessment?

Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specific performance standards embedded in a continuous assessment against a predefined norm.

5. What is a Competency Element?

An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.

6. What is a Competency Unit?

A discrete function consisting of a number of competency elements

7. Will every Training Organization be allowed to deliver MPL training?

No, it needs a special approval according to ICAO Annex 1. Chapter 1.2.8 plus Appendix 2 to Chapter 1.

8. Is the traditional integrated ATPL course still available?

Yes

9. What is the meaning of phase 1?

Single Pilot Training in aeroplanes and FSTD to consolidate basic aeronautical knowledge in the real single pilot environment

10. Is solo flying required?

Yes; the minimum is the requirement for PPL which is 10 hours; but most of the trial courses which have started around the world contain between 6 and 20 hours solo flight time.

11. Upset recovery: Why is it necessary and in which phase should it happen?

Upset recovery training is a new element in MPL training. It serves to increase the pilot's ability to recognize and avoid upset situations and to improve the pilot's ability to recover control, if avoidance is not successful. In addition it shall substantiate confidence of the crew member in his core flying skills.

It can be done at any time during the course, preferably to the end of phase 1 or in phase 2. The ideal Upset Recovery training module should consist of a set of aircraft and FSTD lessons to combine both, human sensorial aspects and flight characteristics of modern swept-wing aircraft.

12. How many hours airplane flying is required?

35 hrs (minimum for PPL), although most of the trial courses which have started around the world contain 80-90 hrs (including solo flight time) on single engine piston airplane and around 30 hrs FNPT I for VFR preparation and basic instrument training.

13. Can PNF hours be credited in phase 1?

No, see answer question 2.

14. What are the requirements for a MPL holder to become Captain?

Same as today for CPL/IR or ATPL holders.

15. Can a MPL holder fly single pilot commercial operation?

No; s/he needs additional training, see ICAO Annex 1, Chapter 2.5.2.3 and JAR-FCL Amendment # 7, JAR-FCL 1.510 (a) (2)

16. Will the MPL be globally acknowledged?

Yes, as long as the National requirements match the ICAO Annex 1 SARPS

17. Why is the cooperation between ATO and a specific airline necessary for a successful MPL training (see Appendix 1 to JAR-FCL 1.520 & 1.525, § 2)?

Because from phase 2 and onwards the training should be conducted according to the SOPs of that specific airline

18. What, if a MPL holder who has graduated on A320 needs to fly B737 (or Embraer or Canadair or other Multi Pilot transport airplane) or vice versa?

S/he needs a regular type rating and if applicable an adaption to the operation of the new airline.

19. Can previous experience be credited towards a MPL course?

No (see Appendix 1 to JAR-FCL 1.520 & 1.525, § 4)

20. Can previous experience acquired in a MPL course be credited towards a traditional integrated or modular ATPL course?

Yes, up to the decision of the responsible NAA (see Appendix 1 to JAR-FCL 1.520 & 1.525, § 4).

21. Is ATC simulation required?

Yes, in Annex 1 recommended, in JAR-FCL a requirement. The industry is working on it. It can be substituted by alternate means of compliance individually approved by the NAA.

New ICAO Doc. 9625 Edition 3 is recommending a grace period of 4 years.

22. Does a MPL instructor need a special training?

Yes, in Annex 1 recommended, in JAR-FCL a requirement (see JAR-FCL Amendment # 7, JAR-FCL 1.310 (d) (1), (2) and (3))

23. Does an instructor delivering training in phase 2 need multi-crew operation experience?

Yes

24. How long should a MPL course be?

Around 18 month at least in the trial phase.

25. Was the pilot shortage in Asia the trigger for MPL?

NO, when the FCLTP convened for its first meeting in 2002 the world's civil aviation suffered from 9/11 and other severe negative economic impacts; events that suppressed demand for air transport services, and hence pilot recruiting

It can not cure the shortage, but it can minimize the threat inherent to the shortage.

26. Was the MPL developed to save money and time?

The MPL initiative is NOT meant to reduce training effort and time

The MPL initiative is NOT economy driven, but it will improve efficiency by the fact that it enhances operational safety by producing better pilots.

Its development was driven by the fact that the 40-years old Standards of Annex 1 and Annex 6 had become out of step with the evolving industry practice, the developments of simulation and of modern Instructional System Design.

27. When can the EASA Part FCL (including MPL) and the related Implementing Rules be expected to be in force?

Not before mid of 2010

28. Why is training on small, straight wing, single engine piston (SEP) airplane beyond a certain minimum counterproductive or at least useless in the training process for future pilots on modern multi-crew jet transport airplane?

(Minutes of the discussion during the first FCLT-Panel in Montreal in December 2003)

- a) The reduction of training on SEP aeroplanes was subject to intense discussion within the Panel. Some of the participants identified basic flying skills as still being important to the development of future multi-crew pilots and, therefore, questioned the validity of reducing SEP aeroplane training. They claimed that a reduction would result in a critical degradation of basic flying skills.

Such concerns, however, ignore the fact that, in spite of the continued importance of basic flying skills, interpersonal skills, such as threat and error management (TEM), communication, leadership, teamwork, workload management, situational awareness and structured decision making are more important to the successful handling of system degradation or to the occurrence of an abnormal situation in a multi-crew environment. There is no question that future multi-crew airline pilots must have the ability to manually control a modern transport aeroplane in all maneuvers and situations. However, since the 'stick and rudder' skills for flying a multi-crew aeroplane are completely different to those required to handle a SEP aeroplane, they can only be acquired in Level D simulators or in the corresponding transport aeroplane.

It is not possible to train and develop these handling skills in SEP aeroplanes.

- b) If it is agreed that, at high levels of stress, humans revert to the basics first learned for a specific task, then it stands to reason that basic training on SEP aeroplanes for the MPL is, beyond a certain level, counterproductive, if not unsafe.

Swept-wing jet transport aeroplanes have very different handling characteristics to those of SEP aeroplanes in most regimes, including a substantially greater speed range, and take-off, landing and pitch and power techniques.

The ab initio student, having thoroughly learned the basic skills needed to manually control a SEP aeroplane, very often has difficulties to re-learn and acquire the completely different basic skills needed to manually control a modern jet transport aeroplane.

The facts show that the use of SEP aeroplanes to train multi-crew airline pilots, establish basic skills which may be hazardous if reverted to, under stressful situations, whilst flying a modern transport aeroplane.

- c) The agreement that training must be done in a sufficient amount to enable it to settle in the long term memory, also argues in favour of a substantial reduction of SEP aeroplane training for the MPL.

Instead, greater emphasis has to be placed, at the very early stages of training, on the technical, procedural and interpersonal behavioral domains that are most relevant to multi-crew operations in commercial jet transport aeroplanes.

Training in SEP aeroplanes should be just sufficient for the student to:

- appreciate the feel of aerodynamic laws in the real environment;
- gain an insight into the use of aviation language, including ATC phraseology and the use of general procedures in aviation;

29. What is Threat and Error Management (TEM)?

TEM is the latest development in the long history of CRM as a successful safety concept; whereby CRM can now be seen to be the “toolkit” for a successful TEM.

TEM is also an overarching pilot competency (consisting of skills, knowledge and attitude) which pervades the whole dynamic process of a flight, or a series of flights, from the very moment the crew meets at the check in counter until the completion of the shut down checklist at the end of a duty cycle.

For further details see ICAO Doc. 9868 “PANS TRG”, Attachment C to Chapter 3 and ICAO Doc. 9683 “The Human Factors Training Manual”, Part II, Chapter 2.

30. Who delivered or does actually deliver or plans to deliver MPL courses, how many students for which type of airplane and who was/is the cooperating airline?

CAPA, Denmark for Sterling, 2006 to 2008, 19 graduates on B737NG. No courses at the moment

Alteon, Australia, for Chinese airlines, 2006/2007, 6 graduates on B737NG. No courses at the moment

Swiss Aviation Training for Swiss, started 2007, 14 graduates, 14 students in training on A320

CAFUC, China, for Chinese Airlines, started 2 trial courses in 2008, 6 students each on A320

Flight School Käufer, Germany, for Air Berlin, started 5/2008, for A320

Lufthansa Flight Training, for Lufthansa, started 3/2008, 24 students, 10 courses per year

Lund University, Sweden, airline unknown, started in 2008, student numbers and type of airplane unknown

OAA, UK for Flybe, expected start in summer 2009 on Dash 8

STATA, Singapore for Jetstar, expected start in summer 2009, 6 students on A320

EAA, Egypt for Egyptair, expected start in 2010, 6 students for A320

31. What are the major challenges in MPL training?

- a) The standardization of instructors (this is the reason why JAR-FCL Amendment 7 requires every instructors who intend to deliver MPL training to successfully complete an MPL Instructor Training Course including an assessment of his competencies).
- b) The development of a profound Lesson Plan and Syllabus for all phases of the course
- c) The elaboration of a Performance Norm and a Grading System, which allow reliable measurement (grading) of the students performance by instructors in every single lesson.

This in turn requires the precise definition of the behavior (typically categorized into Technical, Operational and Human Factor elements) which the student has to show to reach certain grades.

- d) Validation of the MPL course by evaluating the observed performance of the graduates during line operation.

32. What is the impact of the new ICAO Doc. 9625 Edition 3 “Manual of Criteria for the Qualification of Flight Simulation Training Devices”.

It gives a description of the minimum technical requirements, validation and objective and subjective testing of the devices required in the different phases of the MPL training.

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