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Theme 3: Other safety issues
Topic 3.3: Any Other Safety Related Topics

FUTURE PILOT TRAINING

(Presented by Spain, on behalf of the European Union and its Member States[1], and by the other States Members of the European Civil Aviation Conference[2] and by EUROCONTROL)

SUMMARY

The aviation community is discussing the need to further improve pilot training in response to the development of new aircraft, changes in aircraft design, increasing automation and reduced manual flying. Current pilot training may not be fully adequate to address the changing aviation environment, and new training methods and philosophies are being developed. It is argued that for highly automated aircraft in commercial aviation, prescriptive training should be partly replaced by competency and evidence-based training.

An International Pilot Training Conference organised in November 2009 by the European Aviation Safety Agency identified a need to look carefully at the aviation system as it is today, and to assess current safety performance, as a basis for evidence-based action to be taken to shape future pilot training.

Action: The Conference is invited to:

Recommend to ICAO the establishment of a working group to:

a) seek a global consensus on the approach to be taken to shape future pilot training, in particular by:
   i) reviewing the rules for the Multi-crew Pilot Licence with regard to the minimum requirements and establish whether they need to be amended; and
   ii) reviewing the work done in the field of evidence-based and competency-based training, and eventually include the corresponding training methodologies in the rules, taking into account that some prescriptive rules will have to be maintained;
b) review requirements so as to ensure that procedures and practices are in place to guard against the loss of manual flying skills; and
c) support, through appropriate means, the need for broad implementation of Threat and Error Management training for pilots.

[1] Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

[2] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Croatia, Georgia, Iceland, Monaco, Montenegro, Norway, Republic of Moldova, San Marino, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

1. INTRODUCTION

1.1 On 24 November 2009 the European Aviation Safety Agency (EASA) organised an International Pilot Training Conference, under the title "Are pilots trained today to meet tomorrow's challenge?" During the conference discussions there was voiced some general concern about current pilot training in commercial aviation. This paper summarises the results of the Conference and proposes actions to be taken at ICAO level with the objective of better shaping pilot training to match the future challenges in commercial aviation.

2. PILOT TRAINING

2.1 Pilot performance is the centrepiece of the safe operation of aircraft, and poor pilot performance is a contributing factor – or, in some cases, *the* factor – leading to an incident or accident. In order to gain, maintain and improve good pilot performance for the safe operation of aircraft in commercial aviation the rules that have been set for pilot training must be continuously maintained and improved to address present and future challenges. Pilot training in this context encompasses initial training, type rating training, and recurrent training, both in aircraft and simulators.

2.2 The principles of flight and the laws of physics do not change. However the capability and complexity of new aircraft is a challenge. The greater use of automation in aircraft operations provides less opportunity for manual flying to be practiced, and creates specific challenges in relation to man-machine interface design and operation. Rising air traffic volumes, evolving operational systems and new aerodrome concepts all affect the workload of pilots. These are sound reasons to consider new approaches for pilot training and to review traditional methods.

2.3 The EASA International Pilot Training Conference identified the following concerns about current pilot training:

a) While it is not possible to regulate professionalism, **good organisational safety culture** has many benefits and needs to be encouraged;

b) There is a growing body of evidence to support the hypothesis that **over-reliance on automatics** can lead to dependency, complacency and confusion. This hypothesis should be further validated by safety data before any mitigation is implemented.

c) Highly automated aeroplanes mean **fewer opportunities for manual flying** skills to be used, and early evidence suggests that a pilot's confidence in his or her own manual flying capability declines with reduced currency regardless of the overall level of experience. On the other hand, proper management of automation has combined positive impacts on safety by reducing human factors incidents and accidents, operational and fuel efficiency and reduction of emissions.

d) The **ability to recover from unusual aircraft attitudes**, for example following a malfunction in the automatic flight control system and late recognition of the situation by the flight crew, should be optimized. One must be mindful that a one-size-fits-all solution for this is not appropriate and that the latest generation of aircraft may introduce specific training requirements for the early recognition of aircraft upset.

2.4 The EASA Conference also identified other topics as needing to be addressed when discussing pilot training:

e) **Training methods** – the development of evidence based training and competence based training as means of future pilot training in airlines;

f) **Pilot selection** – to ensure that those who start a career are likely to have the necessary skills;

g) **Instructor training** – to improve training techniques and to ensure continuous high quality training;

h) Thorough / in-depth **analysis** of incidents and accidents to provide a sound basis for identifying training needs and

i) The problem of so-called **"negative" training** should be better understood and clear guidance made available, so that pilots can be confident that the training always prepares them for real life operational situations.

2.5 The conclusions of the Conference also emphasised the need to use a methodical and collaborative approach to shape future pilot training.

3. EVIDENCE, AND THE NEED FOR FURTHER WORK

3.1 Much of the work completed to date has been helpful, but there remains an overall lack of detailed quantitative data. Whilst analysis, investigation and research have increased knowledge of the specific issues related to Loss of Control (LOC), there remains much in-depth work that can be done to better understand the part played by pilot training in accidents and incidents.

3.2 It is therefore considered important not only to pursue actions that can be wholly justified by the work undertaken so far, but also to continue analyses that may help identify other courses of action that will also prove to have safety benefits. The broader exchange of relevant safety information plays an important role in this respect.

3.3 Although ICAO adopted the Multi-crew Pilot Licence (MPL) standards many years ago, implementation has so far been poor and a review is needed. The licence focuses on *ab initio* pilot training. MPL training and assessment is competency-based and involve a multi-crew environment and Threat and Error Management from the onset.

3.4 The requirement for a flight crew training intervention known as Threat and Error Management (TEM) has been incorporated in Annex 6 (Operation of Aircraft) since 2006. A similar requirement exists in Annex 1 (Personnel Licensing) for the issuance of all pilot licences. TEM training was designed to augment Crew Resource Management (CRM) training. TEM training should be encouraged.

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