



WORKING PAPER

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Agenda Item 6: Future direction

6.1: Implementation plans and methodologies

**GLOBAL HARMONIZATION OF AIR TRAFFIC CONTROLLERS LICENSING INCLUDING
TRAINING AND RATING PROCESSES – USE OF SYNTHETIC TRAINING DEVICES**

(Presented by the Presidency of the European Union on behalf of the European Union
and its Member States¹; by the other Member States of the European Civil Aviation
Conference²; and by the Member States of EUROCONTROL)

SUMMARY

As the air navigation system evolves, the ATM community continues to face the challenge of achieving integration, interoperability and harmonization of systems leading to the concept of “One Sky” for the international civil aviation. The new Global Air Navigation Plan (GANP) and the corresponding aviation system block upgrades (ASBU) will transform the way air navigation is conducted, having an impact on ATM personnel. For a more efficient deployment of the GANP, an improvement and adaptation of the human performance is to be considered as a transversal enabler to the concrete improvement areas, such as the four performance improvement areas (PIAs) proposed by ICAO.

On the other hand part of the ATM work force, namely air traffic controllers are in scarce availability in various regions. Thus, in complement to the above, mechanisms that may facilitate their mobility among ATS units and service providers all around the world will improve the efficiency of the Global ATM system.

Taking into account the future needs in an increasingly global environment for the provision of ANS, this paper proposes to elaborate further the training and licensing requirements of ATC personnel, with the objectives of increasing aviation safety, harmonization and efficiency. Additionally, further efficiency in ATC training can be leveraged by the use of advanced synthetic training devices.

Action: The Conference is invited to agree to the recommendations in paragraph 3.

1. INTRODUCTION

1.1 In addressing the challenge of integration, interoperability and harmonization of systems leading to the concept of “One Sky” for international civil aviation, ICAO acknowledges that the successful

¹ Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom. All these 27 States are also Members of ECAC.

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

rollout of new concepts and technologies will depend on well synchronized strategies for education and training while maintaining the high level of safety when implementing the change. Based on Europe's experience, in the case of air traffic controllers, the harmonization of training is a result of a common licensing and training scheme, including the definition of the tools, processes and human resources necessary to achieve such a harmonization. Parallel to the above, in the planning and deployment of air navigation plans in various regions worldwide it is understood that an improvement and adaptation of the human performance (HP) is to be considered as a transversal enabler to the concrete improvement areas, such as the four performance improvement areas (PIAs) proposed by ICAO.

1.2 The European Union (EU) and its Member States and the other Member States of the European Civil Aviation Conference (ECAC) note that there is some general concern about training in aviation.

1.3 A European air traffic management (ATM) system must be safe, efficient and economical and be a complete system that is capable of fulfilling aviation growth potential. However acute human resources issues could have an impact on future growth. The training of future aviation professionals is essential to realise the benefits of the introduction of new technologies.

1.4 The aviation community sees a need to further improve the training of aviation professionals. The reasons are, among others, the development of new aircraft, increasingly automated systems providing less opportunity for manual flying, raising traffic numbers and evolving operational ATM and aerodrome concepts. Training as it is conducted today may not always be adequate to address the changing aviation environment and new training methods and philosophies are being developed. It is argued that for highly automated systems prescriptive training should partly be replaced by competency based training but it must also be taken into account that any changes to training need to be carefully evaluated before any action can be taken.

1.5 Worldwide regulatory change is taking place in the field of training.

1.6 ATM supported by data integration and collaborative decision-making requires a high degree of coordination among the stakeholders and competent authorities.

1.7 The role of the actors in the system of systems is changing. There is a shift from activities centred on controlling outcomes to those centred on managing activities.

1.8 The above points support the concept of human performance as a transversal enabler for all categories of personnel. However, this paper focuses on the air traffic controller.

1.9 This paper reaffirms the need to further mature the enabling HP tasks or modules that should complement ICAO's aviation system block upgrades (ASBUs) and specifically proposes further work in the areas of air traffic controller licensing and training including:

- a) further elaboration of different qualifications and ratings including: assessors and instructors;
- b) harmonization of the elementary contents of the initial training;
- c) elaboration of minimum content of initial and unit training and for maintenance of competence;
- d) development of a framework for the air traffic controllers licence recognition; and

- e) processes and tools, including synthetic training devices (a term used to incorporate simulators and other technological-based devices that could be used in the provision of ATC training).

2. DISCUSSION

2.1 ICAO, has developed provisions in relation to training and licensing for pilots, for flying crew other than pilots, aircraft maintenance personnel, air traffic controllers, and other personnel. However, not all these categories of personnel have their training and licensing requirements and recommended practices developed at international level to the same extent of detail and depth, this being particularly so as regards air traffic controllers which, for example are not yet included in the PANS-TRG (Doc 9868).

2.2 The Global Plan Initiatives (GPIs) incorporated into the GANP in 2007 included one on Human resource development and training needs. The new GANP recognizes as one of its primary purposes the global coordination of training, to enable a globally-harmonized ATM system supporting every region and State.

2.3 The introduction of the concept of “One Sky” and the implementation of the new GANP, together with the fact that the new global context requires more flexibility and efficiency out of scarce ANS resources, requires an in-depth study to harmonize further training and licensing requirements for ATC personnel. In parallel with this work, the great impact that the new technological tools will have on air navigation service provision will also need to be considered.

2.4 As it has been proven in current and previous regional air navigation plans that have the objective of deploying and harmonizing technology and structures to improve aviation safety and to maintain or reduce costs, ICAO should include a transversal enabling element to its PIA’s in the form of a systemic improvement and adaptation of the human performance system within ATM.

2.5 This enabling area has a relatively wide scope ranging from the analysis of the human element of the system, of the gap analysis between today’s situation and the target situation, the tools and procedures to be used to facilitate the bridging of the gap and finally a deployment plan that takes into account the regional service level requirements, starting points, investment needed and inherent risks. The scope of this paper is to:

- a) advocate for the definition of a human performance improvement and adaptation transversal enabling area to ICAO’s PIAs in general;
- b) propose further studies on the development of provisions, including new SARPs, as necessary, and guidance on ATC personnel training and licensing with a view to promote harmonization and adaptation to PIA requirements; and
- c) consider, in parallel with the above, developing descriptions and guidelines on the characteristics and usage of synthetic training devices which can be considered as enablers to air traffic controller training.

2.6 The remaining part of this section introduces the direction of the study in the last two points.

2.7 A Global Plan will need harmonized processes for licensing and for training.

ATCO Training

2.8 In terms of air traffic controller training, the current ICAO Annex 1 establishes minimum training requirements for ATC initial training and for unit training but it does not elaborate further on the requirements for training. Furthermore the different level of complexity and maturity of ATM in the various regions worldwide has created severe differences in skill and knowledge requirements, which is impeding harmonization and the flexible use of workforce on a global scale.

2.9 Globalized air traffic controller training should be divided into four parts:

- a) initial training, providing basic and rating training, leading to the granting of a student licence;
- b) unit training, leading to the granting of an air traffic controller licence
- c) continuation training, keeping the endorsements of the licence valid
- d) further training, granting further endorsements such as for instructors or assessors

2.10 Guidelines and recommended practices should be developed on each of these.

ATC Instructors

2.11 Currently the role of an ATCO instructor is not defined by ICAO. Current regional practices however do, as is in the case of Europe where currently requirements for theoretical and for practical instructors are clearly laid down.

2.12 In order to harmonize ATC personnel and ATC training, a common approach to the requirements, privileges and responsibilities of an ATC instructor should be developed further at a global level. In addition, the skills and other requirements for an instructor should go hand in hand with the characteristics of the phase of training for which instruction is required. This categorization will guarantee safety whilst increasing efficiency in terms of personnel management.

ATC Assessors

2.13 Similar to the case of ATC instructors, international regulations do not usually clarify who is responsible for evaluating ATC training and what the requirements are.

2.14 With the aims of enhancing safety and of harmonising ATC licensing worldwide, assessor responsibilities and privileges should be agreed at a global level.

Training processes and synthetic training devices

2.15 Another area that needs harmonization in ATC training is the description of processes and tools necessary for providing training. In Europe, through the SES regulation, training organizations are required to be certified, including qualitative requirements and personnel and equipment descriptions necessary for the provision of ATC training. This, not only serves as an enabler towards enhancements in safety, but also guarantees that ATC training is harmonized across participating States. This paper suggests that ICAO takes a similar direction at a global level.

2.16 In terms of tools, current ICAO documentation only mentions the use of a radar simulator once, in precision approach practice. ATC simulators are nowhere mentioned. To enable further improvements

in training quality whilst allowing flexibility, and in order to regulate the appropriate use of tools, there is a need to describe the main characteristics of synthetic training devices that could supply, during different phases of ATC training and at various levels of fidelity and functionality, the different elements that assist in the training and competence maintenance of air traffic controllers.

3. CONCLUSION

3.1 In addressing the challenges of integration, interoperability and harmonization of systems leading to the concept of “One Sky” for international civil aviation, ICAO acknowledges that the successful rollout of new concepts and technologies within the global framework for air navigation contemplated in the GANP will depend on well synchronized strategies for education and training. Based on European experience, in the case of air traffic controllers, and other personnel, the harmonization of training implies the harmonization of the licensing and training systems, including the definition of the tools, processes and human resources necessary to achieve such a harmonization. Europe’s large experience (notably EASA) could be further shared within the upcoming work to be done by ICAO as mentioned below in order to align the rules on a global basis.

3.2 In parallel to that, in the definition and deployment of air navigation plans in various regions worldwide it is understood that an improvement and adaptation of the human performance is to be considered as a transversal enabler to the concrete improvement areas, such as the four PIAs proposed by ICAO.

3.3 In particular, the harmonization of air traffic controller training and licensing, including a air traffic controllers licence recognition framework, is a key enabler to promote harmonization and adaptation to PIA requirements. There appears a need for ICAO to consider further elaboration in this area, in terms of the development of new provisions including SARPs as appropriate as well as guidance material. This can also become an enabler for increased mobility and cooperation of the ATC network in an open environment. This paper suggests that this may be best facilitated with the support of a multi-regional task-force, with the participation of the relevant stakeholders, States and industry (ANSPs and training organizations). There is also a subsequent need to study the potential use of the new technologies in the field of synthetic training devices for ATC training purposes, and ICAO may consider the setting up of a parallel task force to assist in that objective.

3.4 On this the basis of the above, the Conference is invited to agree to the following recommendation:

Recommendation 6/x– Global harmonization of air traffic controller’s licensing processes and use of synthetic training devices

That:

- a) the Conference acknowledges the need for the definition of a human performance improvement and adaptation transversal enabling area to ICAO’s performance improvement areas;
- b) the Conference acknowledges the need for further harmonization in the requirements as well as guidance for air traffic control training and licensing, including requirements on air traffic controller training organizations and the use of synthetic training devices;
- c) ICAO undertakes a work program to address the development of provisions, including new Standards and Recommended Practices (SARPs) as necessary, and guidance material on air traffic control personnel training, including instructors and assessors, and licensing

with a view to promote harmonization, based on the elements presented in this working paper as well as other aspects as they may deem necessary;

- d) ICAO considers the establishment of a multi-regional task-force, including State and industry stakeholders, to develop the basis for those provisions; and
- e) ICAO consider the setting up in parallel to the above of a task force, including State and industry stakeholders, to develop descriptions and guidelines on different categories of synthetic training devices and their respective usage.

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