



Agenda

Item 5: Operational Safety

**STANDARIZATION AND CERTIFICATION OF TECHNICAL KNOWLEDGE FOR
AIR TRAFFIC CONTROLLERS (ATCO) OF THE SAM REGION**

(Presented by Chile)

SUMMARY

This study note presents the need to standardize the knowledge associated with technical performance matters of SAM ATCOs, so that the competencies of the latter closely coincide with the services and procedures related to the advancement of the systems that make up the ATM.

References:

- Annex 1 — Personnel licenses
- Procedures for Air Navigation Services — Training (PANS-TRG) (Doc 9868)
- Manual on competency-based training and evaluation of air traffic controllers (Doc 10056)
- Global Air Navigation Plan (Doc 9750)
- Global Plan for Aviation Safety (Doc 10004)
- Current resolutions of the Assembly (as of October 7, 2021) (Doc 10184)
- National Air Navigation Plans
- CAR/SAM Air Navigation Plan
- Performance Based Implementation Plan (PBIP)
- CAR/SAM CNS-ATM Plan

1. Background

1.1 In the context of air traffic management (ATM), the constant evolution of technology has been an ally to improve procedures and safety of operations; however, even when the development of new and efficient systems significantly facilitates the functions of the parties, sometimes these can become an operational security risk if we fail to consider the transformation of tasks and functions of human beings operating these new structures within the risk management process.

1.2 If we think, then, that the competencies required by ATCOs to carry out their work have evolved and changed according to the increase in air traffic and the modernization of the system that surrounds national and international air transport, it would be logical to affirm that these new ways of providing air traffic services must be accompanied by updated training and certification methods that guarantee the validity of these competencies.

1.3 On the other hand, the lack of global standardization sometimes clouds the efforts made by States to develop training and certification processes for ATCOs and causes the issuance and validation of licenses to vary from one State to another; a situation that will become even more complex in the future due to the independent and unsystematic implementation of capabilities by States.

1.4 From the above, the development and establishment of a collaborative process at the international level is clearly necessary to allow the homologation and certification of the technical knowledge of the ATCOs of the SAM region, which in turn will allow to initiate new training practices that favor the coordinated, continuous and updated training of professionals, through Competency-Based Training and Assessment (CBTA) promoted by ICAO. This will contribute significantly to achieve and maintain desirable safety levels with a view to a seamless national, regional and global ATM system of excellence, which will provide greater fluidity and dynamism to global aviation, and allow the adaptation of the competencies of Air Traffic Controllers to the dizzying evolution of current and future systems.

2. Analysis

2.1 The increase in traffic and the permanent increase in new technologies have caused a different dynamic in the provision of air navigation services, giving rise to more complex ATC procedures that, in turn, make it necessary for ATCOs to incorporate additional knowledge associated with the evolution of ATM systems.

2.1.1 Based on the above, we must then face the complexity of an interconnected and collaborative air traffic management system, towards which our region is advancing and which highlights the need to have competent professionals who guarantee harmonious, integrated, joint, safe and efficient operations. In this sense, as the ATCO-pilot, ATCO-system, pilot-system and system-system interfaces evolve, the ATCOs that manage and operate these increasingly sophisticated and complex structures must share a common reference of knowledge, to ensure systemic, reliable and smooth operations.

2.1.2 We can say then that, in this evolution, the human factor plays a fundamental role. The consideration of this argument is an integral part of the operational security management necessary to understand, identify and mitigate risks, as well as to optimize contributions to the organizations' objectives.

2.1.3 Many ICAO documents support the above and indicate how safety management processes, related to risk management, must consider human factors, including the evolution of their tasks and functions within the system, the training necessary to ensure competence in the execution of functions, effectiveness of instruction and adaptation of training programs to meet changing needs.

2.1.4 In short, improvements in processes to confront new systems and technologies reinforce the changes that make it possible to obtain qualitative advances in results; but these will only become effective by preparing staff and ensuring the necessary integration of people and teams, with new processes and technological tools. This premise accompanies the success of all organizational management and consequently contributes to operational safety.

2.2 Human factor

2.2.1 In the theory of Lázarus ⁽³⁾ on stress, cognitive assessment is an evaluation process in which the reasons why a specific relationship between the individual and the environment is stressful are determined (Cano Vindel, 1995). That is, the stress that people experience is based on a particular relationship between the individual and their environment, that is appraised by them as taxing or exceeding their resources, and endangering their well-being. This definition considers the individual-environment relationship as fundamental. When a person personally evaluates that they do not have resources or that their level of competence is not at the level it should be to face a situation, their emotional, cognitive and behavioral response will be highly reactive.

³⁾ Lazarus – American psychologist, professor in the Department of Psychology at the University of California, Berkeley. Recognized by the psychology magazine “American Psychologist” as one of the most influential psychologists in his field. Pioneer in the study of emotion and stress, especially their relationship with cognition.

Therefore, it is evaluated as a protective factor for mental and physical health that professionals maintain high levels of skills to face their daily tasks, which will help them modulate the automatic response to demanding situations.

2.2.2 We must consider then, that the lack of knowledge generates stress and insecurity. The fear of “not knowing,” of making mistakes, leads to physical and psychological disorders in the ATCO, limiting personal and professional development, affecting the work environment, degrading organizational results and putting operational safety at risk. Therefore, increasing the competencies of the ATCO through the processes proposed in this Study Note, will contribute to improving their quality of life, stimulating motivation and pleasure in the work they do, which is at the same time a contributing factor to operational safety risk management.

2.3 **Diagnostic evaluation process, homologation, evaluation and certification programs for ATCOs in the SAM region**

2.3.1 Considering the benefits provided by cooperation and the joint use of existing resources in terms of training at a global level, it is suggested that a technical-academic collaboration between the States and their corresponding specialized organizations to address the emerging ATM needs of the region, will allow the exchange of experiences for the design, planning, execution and control of the standardization and certification program of technical knowledge for ATCOs of the SAM region. This will promote the development of a standardized and harmonized training scheme based on the new competencies required for Air Traffic Controllers in the region, which will allow updating the regional training platform, providing an initial reference framework for a coordinated, regular and updated training for SAM ATCOs.

2.3.2 To meet the objective set out in this Study Note, the suggested actions to carry out the proposed homologation and certification procedures are generally described below:

- a) Define the relevant knowledge, for each of the six ATCO ratings listed in Annex 1.

Note: The knowledge relevant to each of the ratings appears in Annex 1 and is complemented by the provisions of the Procedures for Air Navigation Services - Training (PANS-TRG) (Doc 9868) and Manual on Air Traffic Controller Competency-based Training and Assessment (Doc 10056);

- b) Develop and implement a diagnostic evaluation method that contains the knowledge mentioned in the previous point.

Note: It is suggested that a random evaluation is applied to a certain number of ATCOs, to holders of each of the licenses detailed in Annex 1 and to each of the States that make up the SAM region. This will allow obtaining a representative sample to determine the gap in required technical knowledge;

- c) Develop a skills-based training program, with the purpose of achieving the standardization of updated technical knowledge that closely coincides with the services and procedures associated with the evolution of ATM systems; and
- d) Periodically evaluate and certify the knowledge acquired by the ATCOs.

2.4 **Conclusion**

2.4.1 The ATCO environment is complex and rapidly changing. The constant evolution of technologies, procedures and operational techniques that frame the tasks and functions of ATCOs require continuous learning. The identification of updated ATM subjects, together with the diagnostic evaluation at the regional level, will allow the development of competency-based training and

certification, which contributes to standardizing the technical knowledge of Air Traffic Controllers in the SAM region, improving performance, understanding the processes and the individual-environment relationship. In this context, international cooperation is vital for the development of a training program that facilitates the training activities necessary to update and standardize the technical knowledge of ATCOs at the regional level. The latter, aligned with the ICAO “no country left behind” (NCLB) strategy, will contribute to the harmonious regional and global application of the Standards and Recommended Practices (SARPs), ICAO Global Plans and consequently to operational security.

2.4.2 Finally, the objective set out in this Study Note will provide our region with an initial framework for a systemic approach to CBTA, which contributes to the synchronized, regular and updated training of SAM ATCOs, in accordance with the evolution of the ATM system.

3. **Suggested actions**

3.1 The processes of standardization and certification of knowledge for SAM ATCOs proposed in this Study Note will provide the initial framework for a CBTA approach, which will contribute to the coordinated, regular and updated training of professionals in the region, in accordance with the evolution of the ATM system and with the strategic plans of the International Civil Aviation Organization.

3.2 Taking into account the fundamental role that ICAO plays in promoting cooperation between its Member States, in encouraging the exchange of experience between them and other organizations related to international air transport, together with the reference framework developed by ICAO that seeks to harmonize training programs globally, the meeting is invited to:

- a) approve this Study Note;
- b) promote the exchange of experiences between Member States of the SAM region and any other ICAO State, training organization or entity related to the international air navigation system, to contribute in the design, planning, execution and control of the standardization and certification program of technical knowledge for ATCOs of the SAM region;
- c) request the ICAO Member States to comply with the provisions of Resolution A40-25 (Pages II-51 and II-52, “Assembly Resolutions in Force” as of October 7, 2022 – Doc 10184); and
- d) evaluate the convenience of incorporating the measures proposed in this study note to Project RLA/06/901 “Assistance in the Implementation of a Regional ATM System considering the ATM Operational Concept and the corresponding Technological CNS Support.”