

## BASICS OF PROFESSIONAL AND COMMUNICATIVE COMPETENCE OF AIR TRAFFIC CONTROLLERS IN THE USA

### *Abstract*

*This paper explores the fundamentals of professional and communicative competence required for air traffic controllers (ATCOs). **Purpose.** The article examines the definitions provided by international aviation authorities, the essential elements that make up these competencies, the techniques used for their training and evaluation, and their overall effects on aviation safety and operational effectiveness. It also addresses the difficulties encountered in maintaining these standards and discusses upcoming developments influencing the skills and expertise needed by ATCOs. **Methods.** The document references definitions and standards from organizations like the International Civil Aviation Organizations (ICAO) and the Federal Aviation Administration (FAA). It also analyses various documents and publications related to air traffic control, training, and language proficiency. **Results.** The paper emphasizes that professional competence provides the fundamental knowledge and skills for air traffic control, while communicative competence enables ATCOs to apply this knowledge effectively in real-time interactions, ensuring the safety and efficiency of air travel. The ICAO's framework and FAA's requirements are discussed in details. **Conclusion.** The professional and communicative competence of air traffic controllers is essential for the safe and efficient flow of air traffic. Both competencies are developed through careful training and ongoing evaluation to ensure that ATCOs can effectively manage the difficulties of air traffic control and uphold safety.*

**Key words:** *air traffic controllers; aviation English; Language Proficiency Requirements; professional and communicative competence; training.*

**Introduction.** Professional and communicative competence are critical for air traffic controllers (ATCO) to ensure the safe and efficient flow of air traffic.

Professional competence includes the technical knowledge and abilities needed to efficiently carry out responsibilities and consists of the following important elements:

- Knowledge of regulation and procedures is critical to have a solid comprehension of local airport regulations, air traffic control (ATC) protocols, and international and national aviation legislation.
- Airspace Management is the ability to visualize and control extensive airspace, including sectorization, route layouts, and separation regulations.
- Radar and surveillance skills. Skillfully utilizing radar systems and other surveillance technologies to track aircraft positions, detect possible conflicts, and provide accurate information.
- Navigation and meteorology. Knowing the fundamentals of aircraft navigation and analyzing weather data to make informed decisions about traffic flow and safety.
- Emergency procedure. Through understanding of emergency protocols and the capacity to manage unusual circumstances with composure and efficiency.
- Workload management. The ability to set priorities, oversee several airplanes at once, and remain situationally alert under pressure.
- Decision-making demonstrates the capacity to decide quickly and wisely based on the information at hand, frequently under tight time restrictions.
- Continuous learning. The dedication to maintaining current knowledge of new procedures, technology, and laws through professional development and ongoing training.

Communicative competence is critical in air traffic control, as it directly impacts safety and efficiency; it involves:

- Standard phraseology. To guarantee clear and unambiguous communication with pilots, use standard aviation phraseology with accuracy and fluency as defined by the International Civil Aviation Organization (ICAO) and national authorities.
- Plain language defines the capacity to communicate with non-aviation personnel or in situations where standard phraseology is inadequate, using plain language that is straightforward, succinct, and unambiguous.

- Active listening. Listening intently to pilots' readbacks and other communication to make sure you understand them correctly and to spot any possible miscommunication.
- Clear and concise speech guarantees that communication is easily understood, speak clearly, at a suitable tempo, and with the right pronunciation.
- Readback/Hearback. Following readback/hearback protocols to the letter in order to verify important instructions and clearances.
- Non-verbal communication awareness. When visual communication is feasible, non-verbal communication awareness refers to the ability to identify and interpret non-verbal indications from pilots or other controllers.
- Conflict resolution is the ability to resolve conflicts or deviations from planned routes or procedures.
- Team communication guarantees smooth coordination, keep lines of communication open and efficient with supervisors, support personnel, and other controllers.
- Language proficiency. A high degree of English proficiency is required for international operations, and this is sometimes proven by taking particular language proficiency exam.

**The purpose of the article.** The definitions given by international aviation authorities, the key components of these skills, the methods for teaching and assessing them, and their overall impacts on aviation safety and operational efficiency are all examined in this paper. It also talks about the challenges of upholding current standards and future changes that will affect the knowledge and abilities required of air traffic controllers.

**Methods.** To analyze definitions and regulations from such documents as Federal Aviation Administration (FAA) and the International Civil Aviation Organization (ICAO) in order to highlight main responsibilities, duties and complications when performing the work of air traffic controllers.

**Results.** The fundamental information and abilities for air traffic control are essentially provided by professional competence, and the ability to communicate effectively allows air traffic controllers to apply this knowledge in real-time interaction, thereby ensuring the efficiency and safety of air travel. Through demanding training courses and regular assessments, both fields are continuously evaluated and improved.

Air traffic controllers (ATCOs) occupy a focal role within the aviation industry, shouldering the critical responsibility of ensuring the safe, orderly, and expeditious flow of air traffic across increasingly complex airspace and busy airports. These highly skilled specialists who oversee the ever-changing sky environment are directly responsible for the effectiveness and safety of air transport. The definitions provided by national and international aviation authorities, the essential elements that make up these competencies, the techniques used for their training and evaluation, and their overall effects on aviation safety and operational effectiveness are all examined in this paper, which explores the fundamentals of professional and communicative competence need for air traffic controllers. (Cinar & Tuncal, 2024:55). It will also examine the difficulties that are now being encountered in upholding these high standards and talk about the upcoming developments that will influence the abilities and expertise needed by air traffic controllers.

The International Civil Aviation Organization's (ICAO) definition of professional competence in air traffic control goes beyond task mastery (Manual on the implementation of ICAO the language proficiency requirements, 2010). It includes the ATCO's overall performance in a wide range of activities. The integrated application of knowledge, skills, and attitudes in a variety of operational contexts is emphasized by this competency-based approach. By offering descriptions and observable behavior that demonstrate competences in carrying out professional duties, the ICAO framework outlines the competences required for particular aviation professions (Lauryssen, 2018:12).

Regarding professional advancement within a discipline, these competences are not role-specific; for example, pilots at different career phases will exhibit the same set of competences, but at varying proficiency levels. The main objective is to guarantee that these competences can be efficiently taught, observed, and regularly evaluated in a range of work settings pertinent to a particular aviation field. An ATCO has to demonstrate an integrated performance of all necessary competences to a predetermined standard in order to be considered professionally competent; proof of competent performance must be both legitimate and trustworthy. Furthermore, an attitude toward the standards necessary to carry out the job, including how an ATCO conducts oneself in day-to-day operations while abiding by appropriate norms of behavior, can be broadly defined as professionalism in the field (WIKIFATCA, 2014).

The ability to successfully communicate with pilots and other stakeholders is the emphasis of communicative competence, which is equally important for all air traffic controllers. Communicative competence is a key idea in the communicative language teaching framework that the ICAO has

recommended. The ability of aviation personnel, like pilots and ATCOs, to comprehend and use language effectively in operational settings is highlighted by this framework (Manual on the implementation of ICAO the language proficiency requirements, 2010).

The six essential abilities of communicative competence in this context are vocabulary, structure/grammar, pronunciation, fluency, comprehension, and interaction, according to the ICAO's Language Proficiency Requirements (LPRs) Manual (Manual on the implementation of ICAO the language proficiency requirements, 2010). These skills are assessed holistically on a rating scale with a minimum level of 4 required for radiotelephony communication to be considered qualified. A comprehensive ranking system from level 1 to Level 6, where Level 6 denotes expert proficiency, is used to assess these abilities. For air traffic controllers engaged in radiotelephony communication, a minimum proficiency Level 4, known as the operational level, is required to be considered qualified (ICAO, 2010; Zolfagharian & Khalilpour, 2015:38).

Table 1

### ICAO Language Proficiency Rating Scale of Level 4 Operational

<i>Pronunciation</i>
Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but only sometimes interfere with ease of understanding.
<i>Structure</i>
Basic grammatical structures and sentence patterns are used creatively and are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.
<i>Vocabulary</i>
Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work-related topics. Can often paraphrase successfully when lacking vocabulary in unusual or unexpected circumstances.
<i>Fluency</i>
Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers or connectors. Fillers are not distracting.
<i>Comprehension</i>
Comprehension is mostly accurate on common, concrete, and work-related topics when the accent or variety used is sufficiently intelligible for an international community of users. When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.
<i>Interaction</i>
Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming, or clarifying.

Based on the ICAO Doc 9835

Level 4 signifies the ability to communicate effectively with sufficient accuracy and clarity on routine and some non-routine tasks and in some unexpected situations. Given the growing number of non-native English speakers in the aviation industry, developing and assessing English language proficiency among air traffic controllers is essential to reduce potential miscommunication in global airspace (Manual on Air Traffic Controller Competency-based Training and Assessment, 2017).

Effective communication in globally interconnected aviation industry depends heavily on language proficiency and goes beyond simple operational procedures. Because of this, the International Civil Aviation Organization requires ATCO who fly internationally to have a particularly degree of English language ability. In order to maintain clarity and avoid misconceptions that could seriously compromise aviation safety, English has been declared as the universal language of aviation. (Hamzah, Krish & Hamat, 2022:177).

English is predominant language of communication in aviation due to its international character, hence being able to communicate in English is essential for ATCOs. Effective use of plain English becomes

critical in emergency and non-routine situations, even as conventional phraseology is required for standard communication.

In its “Manual on the Implementation of ICAO Language Proficiency Requirements”, ICAO has made the concept of “plain English” important and relevant to aviation linguistic issues (ICAO, 2010). Because of this, it appears reasonable to refer to “plain aviation English” as a synonym for “general aviation English”. However, the idea of “plain English” in relation to flight has up until now only been declarative (Vitryak, Slipak & Kirpitnyov, 2017:43).

However, Vitryak A., Slipak B., Kirpitnyov S. in their research claimed that there aren’t many studies or appropriate teaching resources specifically devoted to teaching plain English, which is used in radiotelephony. But plain English in addition to standardized radio telephony phraseologies have been long accepted as required and must be taught to future air traffic controllers. Plain English in aviation can be defined as a subset of English which offers sufficient language support for air traffic in all situations that are not addressed by the standardized radiotelephony’s phrasal reserve (Vitryak, Slipak & Kirpitnyov, 2017:48).

While a strong command of English is necessary, communicative competence in air traffic control extends beyond only grammatical precision and lexical range. It also includes the capacity to communicate successfully in real time, frequently under pressure, and to understand a variety of accents.

In addition to handling a variety of professional duties, such as receiving information, encoding and decoding data, and distributing and receiving information, air traffic controllers process a lot of data, frequently in a limited amount of time. Since people’s lives depend on their ability to respond in unusual events and make constructive decisions, it is about a group’s preparation for complex operational activities that are confused by extreme situations. Decisions must be made promptly and accurately.

A complexity of living conditions and activities that has taken on particular significance for an individual or group of individuals is the broadest definition of an extreme situation. (Кокун, Мороз, Пішко & Лозінська, 2021:170). It is necessary to single out the professional qualities necessary for effective job of air traffic controller (Skipalska, 2018:7.70):

- decisiveness
- high self-control
- the ability to make quick decisions
- the ability to act in a non-standard environment that changes quickly
- the ability to perform multiple tasks simultaneously and anticipate changes in situations;
- high stress resistance
- high adaptation skills

These traits and abilities are critical when carrying out work-related responsibilities of ATCOs.

**Discussion.** Although the ICAO offers this general structure, it is acknowledged that due to varying organizational, operational, technical, and regulatory needs, air traffic control environment varies greatly between nations and regions (Nemlii, 2020:33). As a result, training organizations must modify the ICAO competence framework to fit their unique local environment. Lastly, they set the performance criteria that will be applied to determine if a trainee has attained the necessary degree of proficiency. A key resource in this process is ICAO Doc 10056, the manual on Air Traffic Controller Competency-based Training and Assessment, which gives operational units and approved training organizations in air traffic control the direction they need to determine which ATCO competencies are critical to their environment and how to create the training and assessment plans required for the different ATCO development stages. Initial training, training necessary for carrying out control responsibilities at operational units, and continuing training to assist certified ATCOs in preserving their competence are included in these phases. (Manual on Air Traffic Controller Competency-based Training and Assessment, 2017). The basic knowledge and fundamental skills required for air traffic control are taught during initial training at academies and educational institutions, but the process of becoming a truly proficient ATCO is continuous and heavily incorporates on-the-job training aspiring controllers usually move on to on-the-job training at an operational FAA facility or a similar ATC unit after completing formal training, where they are closely supervised and guided by certified and experienced controllers (Cinar & Tuncal, 2024:59). This stage is essential for putting the knowledge and abilities acquired into practice in a real-world situation, where trainees progressively assume more responsibility as their competence increase. Before a controller is considered completely competent and certified as a professional controller, they must complete on-the-job training, which can vary in length but typically lasts two to three years in the FAA system. In order to make sure they fulfill the necessary performance requirements; trainees go through ongoing evaluation and feedback during this period (The FAA Strategic Plan for the 21st Century, 2022).

The concept of lifelong learning is now a key concept in educational policy at both national and international levels. A person who is not focused on self-development through learning may eventually lose the ability to act effectively. Also, if a person devotes his or her time to self-development and self-education, he or she will definitely succeed. Therefore, lifelong learning becomes a necessary condition in the process of achieving success. This task is important not only for the individual, but also for the development of society, which needs competent professionals (Сальников & Козлова, 2020:1232).

The competence of air traffic controllers is crucial for flight safety. Controllers' errors can lead to serious accidents with human casualties. Therefore, the highest standards are set for the selection and training of these specialists. Their professionalism and competence are a guarantee of safe flights. Continuous professional development, use of modern technologies and updating of knowledge, skills and standards of international aviation community ensure a high level of safety in aviation and emphasize the uniqueness of air traffic controllers work (Nemlii, 2020:34; Herasymenko, et al, 2021:503).

To ensure effective and safe communication between air traffic controllers and other air traffic control participants, it is necessary to improve language skills. The Language Proficiency Test aims to test not only the knowledge of standard phraseology, but also the ability to communicate in simple language or plain English (Zolfagharian & Khalilpour, 2015:37).

The purpose of lifelong education for ATCOs is to ensure the necessary development of the individual throughout life, to enable him/her to improve his/her professional level, develop his/her abilities and capabilities when necessary (Xhensila, 2024:28).

In the United States, the Federal Aviation Administration sets forth stringent professional standards and qualifications for individuals aspiring to become air traffic controllers. These prerequisites cover a wide range of topics, such as citizenship, age, educational background or professional experience, and proficiency in English communication. In addition to being citizens of the United States, candidates must typically be younger than 31 when they apply. Qualification requirements usually include a Bachelor's Degree, one year of more responsibility work experience. Also, all candidates must show that they can communicate in English clearly and fluently enough to be understood across communication devices (The FAA Strategic Plan for the 21st Century, 2022).

However, people from a wide range of language and cultural backgrounds make up the international aviation community, which is by nature varied. This diversity can be problematic, especially when interacting with non-native English speakers whose communication styles and accents can differ greatly (Hamzah, Krish & Hamat, 2022:178; Hamzah, Krish & Hamat, 2023:87).

**Conclusion.** The professional and communicative competence of air traffic controllers is essential for the safe and efficient flow of air traffic. Professional competence of air traffic controllers includes technical knowledge, abilities, and skills in areas such as regulations, airspace management, radar skills, navigation, emergency procedures, workload management, decision-making, and continuous learning. Communicative competence involves standard phraseology, plain language, active listening, clear speech, readback, non-verbal communication awareness, conflict resolution, and language proficiency, especially in English for international operations.

According to the DOC 9835, Level 4 of the ICAO Language Proficiency rating Scale is of significant importance because:

- it is the minimum proficiency level required for air traffic controllers to be considered qualified for radiotelephony communication;
- level 4 signifies the ability to communicate effectively with sufficient accuracy and clarity on routine and some non-routine tasks and in some unexpected situations.

It is found that professional and communicative competence for air traffic controllers is defined by the ability to perform their work safely and efficiently together with ability to stay calm under the pressure, to possess good multitasking abilities and use English language in real work situations.

Both competences are developed through rigorous training and ongoing learning to ensure that air traffic controllers manage the complexities of ATCOs and maintain the safety.

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## ОСНОВИ ПРОФЕСІЙНОЇ ТА КОМУНІКАТИВНОЇ КОМПЕТЕНТНОСТІ АВІАДИСПЕТЧЕРІВ У США

### Резюме

У цій статті досліджується основи професійної та комунікативної компетентності, необхідної для диспетчерів управління повітряним рухом (УПР). **Мета.** У статті розглядаються визначення, надані міжнародними авіаційними органами, основні елементи, які складають ці компетенції, методи, що використовуються для їх підготовки та оцінювання, а також їх загальний вплив на безпеку польотів та операційну ефективність. Також розглядаються труднощі, що виникають при підтримці цих стандартів, і обговорюються майбутні зміни, що впливають на навички та досвід, необхідні для УПР. **Методи.** У роботі використано визначення та стандарти таких організацій, як Міжнародна організація цивільної авіації (ІКАО) та Федеральне управління цивільної авіації (ФАА). Також проаналізовано різні документи і публікації, пов'язані з управлінням повітряним рухом, підготовкою і знанням мови. **Результати.** У статті підкреслюється, що професійна компетентність забезпечує фундаментальні знання та навички для управління повітряним рухом, тоді як комунікативна компетентність дозволяє органам УПР ефективно застосовувати ці знання у взаємодії в режимі реального часу, забезпечуючи безпеку та ефективність повітряних перевезень. Детально обговорюється система ІКАО та вимоги FAA. **Висновок.** Професійна та комунікативна компетентність авіадиспетчерів має важливе значення для безпечного та ефективного потоку повітряного руху. Обидві компетентності розвиваються шляхом ретельної підготовки і постійного оцінювання, щоб забезпечити ефективне подолання труднощів управління повітряним рухом і підтримання безпеки польотів.

**Ключові слова:** авіадиспетчери; авіаційна англійська мова; вимоги до рівня володіння мовою; професійна та комунікативна компетентність; підготовка.

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## COMPARATIVE ANALYSIS OF APPROACHES TO FORMING DIGITAL COMPETENCE OF FUTURE PHILOLOGISTS IN TECHNICAL UNIVERSITIES IN UKRAINE AND UNIVERSITIES ABROAD

### Abstract

The article presents the results of theoretical and empirical analysis of approaches to the development of digital competence among future philologists in technical universities in Ukraine and universities abroad. **The aim** of the study is to conduct a comparative analysis of the theoretical foundations and practical aspects of integrating digital components into humanities-oriented educational programs under the conditions of digital transformation in education. The research includes the systematization of scholarly sources, educational standards, and regulatory documents, with a focus on the DigComp and DigCompEdu frameworks and their adaptation within the Ukrainian educational context. Particular attention is given to the content of digital modules in philological training programs, didactic principles of their implementation, and the role of instructors in the digitalization of the learning process. The