



**DIRECTORS GENERAL OF CIVIL AVIATION - ICAO EUROPEAN AND NORTH ATLANTIC  
REGIONS**

**2024 MEETING (EUR/NAT-DGCA/2024)**

*(Toulouse, France, 23 April 2024)*

**Agenda Item 4:** Aviation training and NGAP: Building bridges within and beyond aviation to identify relevant training solutions while optimizing the ICAO Next Generation of Aviation Professionals (NGAP) efforts

**AVIATION TRAINING AND NGAP**

*(Presented by the Secretariat)*

**SUMMARY**

*This Working Paper identifies several challenges related to the skilled workforce required to operate the international air transport system safely, securely, and efficiently. It reviews the training components of these challenges and the associated ICAO initiatives and proposes actions to alleviate them.*

**1. Introduction**

1.1 The smooth functioning of the global aviation system is reliant on a highly trained and skilled workforce. This workforce plays a crucial role in meeting the industry's diverse demands and upholding the highest standards worldwide, aligning with ICAO's strategic objectives and global plans.

1.2 ICAO's pre-COVID projections, as outlined in Doc 9956 - *Global and Regional 20-year Forecasts*, already showed a shortage in the aviation workforce and a significant demand for technicians, pilots, cabin crew members, and air traffic controllers by 2037 to support the projected traffic growth. The COVID-19 pandemic has further exacerbated the existing workforce challenges in the aviation ecosystem as air travel restrictions resulted in significant job losses and early retirements, leading to a loss of experienced personnel and the migration of skilled workers to other industries.

1.3 ICAO's aviation safety and security audits have identified the shortage of qualified aviation personnel as a common deficiency and a root cause for low levels of effective implementation (EI) of critical elements (CEs) in a State's safety oversight system, consequently leading to low levels of compliance with ICAO SARPs.

1.4 The emergence of Advanced Air Mobility (AAM) and the increasing automation of current and future aircraft systems have impacted the traditional roles and required competencies and skills of aviation professionals. As AAM evolves towards autonomous operations, there will be a growing demand for advanced skills in Artificial Intelligence (AI). This example highlights that the air transport industry must

now actively seek out and compete with other high-tech industries for talent with expertise in these cutting-edge fields, as they are essential for the future of aviation.

1.5 The aviation sector, like all other industrial sectors, is seeking to perform in a sustainable way. This challenge is currently transforming it as it strives to meet the ICAO objective of carbon neutrality by 2050. Consequently, this will result in the need for aviation professionals to develop new competencies which could be inspired from other industries with the same goals.

1.6 ICAO, with the support of its TRAINAIR PLUS Programme (TPP) Members and Partners, is committed to help reinforce States' capacity through various initiatives related to aviation training. ICAO Training focuses on empowering current and future generations of aviation professionals with the skills and tools to overcome industry challenges. The techniques and resources provided help build aviation professionals' capabilities and capacity, ensuring they can thrive in a rapidly changing world

## **2. Discussion**

### *Monitoring the Regional Skills Shortage*

2.1 In response to the workforce challenges that our industry is facing, ICAO has revitalized the Next Generation of Aviation Professionals (NGAP) programme and identified the “aviation workforce forecasting, planning, and monitoring” as one of the main focus areas for collaboration among all key stakeholders through joint initiatives and partnerships. ICAO aims to achieve a global and comprehensive understanding of the aviation sector's needs by encouraging stakeholders to collect, analyze, and monitor data on current, medium, and long-term human resources requirements. By gathering comprehensive and reliable data insights covering all aviation disciplines, the aim of this activity is to support policy decisions, identify areas for enhancement, and formulate targeted strategies to meet workforce and training demands. Ultimately, the objective is to bridge the gap between training/education and industry needs, anticipate future aviation workforce and training needs, and develop pertinent strategies for attracting, educating, and retaining aviation professionals within the sector.

2.2 At the regional level, specifically in the European (EUR) Region, the European Aviation System Planning Group (EASPG) works to support the implementation of the *Global Aviation Safety Plan* (GASP) and *Global Air Navigation Plan* (GANP) by identifying and addressing issues in the aviation safety and air navigation fields. Specific challenges have been identified related to the monitoring of the regional skills shortage. To address this shortage, it is crucial to develop new capacities to meet rising challenges for all stakeholders, including with the aviation industry and the State authorities.

2.3 The EASPG noted that following the COVID-19 pandemic, the air transport industry has been rebounding, with 2022 traffic having exceeded the 2021 forecast. Meeting this increased demand has presented staffing issues. The gaps that have been identified are similar to those that existed prior to the pandemic but have become more complex over the last three years. According to a 2023 IATA survey in the EUR Region, the staffing gap between the needs and the current state is 27%, and it is perceived as a quantitative staffing gap rather than a qualitative skills gap. The overarching challenge is attracting and retaining talent in a competitive job market, and ICAO can play a role in monitoring the shortage.

2.4 In view of the above, the EASPG agreed that the ICAO EUR/NAT Office would, in coordination with relevant stakeholders, investigate the feasibility of setting up a regional skills shortage monitoring process and convene a meeting of States and aviation training organizations with a view of alleviating the identified situation of shortage of skills (EASPG Decision 5/2 refers).

2.5 In order to support the implementation of the foregoing initiative, the following draft Conclusion is proposed:

**Draft EUR/NAT-DGCA Conclusion 2024/1 – Regional Skills Shortage**

That the ICAO Regional Director, Europe and North Atlantic:

- a) convene a regional meeting of States, international and regional organizations, industry and aviation training organizations with a view to investigating the feasibility of setting up a regional skills shortage monitoring process; and
- b) invite States, international and regional organizations, industry and aviation training organizations to cooperate with ICAO on the above-mentioned initiative.

*Bridging the gap between Training and Industry Needs*

2.6 Bridging the gap between training and the rapidly evolving aviation industry requires a proactive approach. Training programmes should emphasize adaptable skills and keep pace with emerging technologies and industry trends. Collaboration between training organizations and aviation stakeholders is vital to ensure curricula remain relevant and practical. Internships, mentorships, and industry partnerships offer invaluable real-world experience, allowing trainees to apply their knowledge in dynamic settings. Moreover, fostering a culture of lifelong learning encourages aviation professionals to stay updated and agile in response to industry shifts. By prioritizing flexibility, collaboration, and continuous learning, the aviation sector can effectively bridge the gap between training and the ever-changing demands of the industry.

2.7 To instill best practices from the youngest age and attract a balanced gender into aviation professions, cooperation with organizations and States to fund Next Generation Aviation Professionals Scholarships in aviation disciplines in demand is encouraged. This initiative helps to attract and develop more qualified and competent aviation professionals in line with industry needs, who will be available to operate, manage and maintain the future international air transport system.

*Meeting training needs: the TRAINAIR PLUS Programme*

2.8 The TRAINAIR PLUS Programme (TPP) is a cooperative network of aviation training organizations and industry partners working together to develop and deliver ICAO-recognized training packages. TPP's mission is to improve safety, efficiency, and sustainability of air transport, while establishing, maintaining, and monitoring high standards of training and competency of aviation personnel on a worldwide basis and in a cost-effective manner. TPP promotes training collaboration for the purpose of providing safe, secure, and sustainable development of global air transport having in mind the main objective of actively supporting States in the effective and efficient implementation of ICAO SARPs. The list of TPP Members includes, but is not limited to, training arms of civil aviation authorities (CAAs), airlines, airports, maintenance organizations, and private training organizations recognized by their State. The TPP network also plays a pivotal role in developing new training programmes to meet global, regional, and national training needs on a yearly basis.

2.9 In the EUR/NAT area, there are 14 TPP Members, located in Algeria (Etablissement National de la Navigation Aérienne - CQRENA), France (Centre Français de Formation des Pompiers d'Aéroport - C2FPA), Germany (Kunz GmbH), Italy (ENAV Academy), Kazakhstan (Republican State-owned Enterprise "Kazaeronavigatsia"), Morocco (Loumed Cabin Crew Training Center - LCCTC), The Netherlands (JAA Training Organisation - JAA TO), Russian Federation (Domodedovo Training LLC), Spain (Servicios y Estudios para la Navegación Aérea y la Seguridad Aeronáutica - SENASA), Sweden (Entry Point North AB ATS Academy), Tunisia (Académie Tunisienne de Formation en Sûreté de l'Aviation Civile - AFSAC), Türkiye (IGA Academy Istanbul Airport and Turkish Civil Aviation Academy), and in the United Kingdom (International Fire Training Centre - IFTC).

2.10 In addition to Members, 8 ICAO TPP Corporate Partners are located in the EUR/NAT area, including universities and international organizations in Belgium (University of Antwerp), France (Ecole

Nationale de l'Aviation Civile - ENAC), Italy (University of Messina - UNIME), Luxemburg (EUROCONTROL Aviation Learning Centre), Spain (ENAIRES - Air Navigation Service Provider of Spain), Switzerland (International Federation of Freight Forwarders Associations - FIATA), and in the United Kingdom (Buckinghamshire New University and UK CAA International – UK CAAi).

2.11 Through the TPP network in 2023, 71 ICAO training sessions supporting the implementation of ICAO provisions across all areas of the ICAO training portfolio were delivered in the EUR/NAT area, benefiting a total of 780 participants.

2.12 Through capacity building projects, ICAO can also support States in the establishment or upgrade/enhancement of an aviation training organization. This is conducted in a phased approach with first the identification of the relevant training scope to be covered, then guidance to the training organization in the identification of the training policy and related procedures with the development of the required documentation, followed by the identification and procurement of the specialized equipment to position it as a training hub for the region, and ultimately the qualification of the staff who will manage and operate the training organization. States can select the full spectrum of the capacity building project as previously highlighted or only components, based on their specific needs.

#### *Emphasizing and improving On-the-Job Training (OJT)*

2.13 On-the-Job Training (OJT) in aviation offers a hands-on approach that allows trainees to immerse themselves in real-world scenarios, enhancing their practical skills and knowledge. One of the key benefits is the opportunity for trainees to gain firsthand experience in a dynamic and high-pressure environment, preparing them for the complexities of aviation operations. Additionally, OJT fosters teamwork and collaboration among trainees and experienced professionals, promoting a supportive learning environment.

2.14 However, challenges such as the availability of sufficiently qualified and experienced OJT instructors, ensuring consistent quality of training amongst OJT instructors and maintaining safety standards in a live operational setting can arise. Additionally, OJT requires effective supervision and mentorship to ensure trainees receive adequate guidance and feedback throughout their training, which can sometimes be resource-intensive for aviation organizations, especially considering that OJT is a journey with multiple phases and steps. Balancing these benefits and challenges is essential to maximizing the effectiveness of OJT in aviation training programmes.

2.15 Having these challenges in mind and considering the results of ICAO USOAP audits in the area of training, ICAO has started the development of a portfolio of courses aiming at enhancing and harmonizing the competencies of OJT instructors. Currently 5 courses for OJT instructors are available from the portfolio of ICAO training for dissemination to States.

2.16 States are encouraged to collaborate and assist each other to the possible extent in the provision of OJTs for CAA Inspectors. The ICAO EUR/NAT Office can assist in facilitating the expression and the dissemination of OJT-related needs from States as well as the matching of the latter with potential OJT opportunities that may be offered on an annual basis by other States from the EUR/NAT area. This initiative does not aim to circumvent existing agreements of collaboration and technical assistance between State Authorities but rather to provide good ground for expanding their scope or the establishment of new ones, as deemed appropriate.

2.17 States offering OJT opportunities would be included in the list of ICAO Partners which are actively contributing to the ICAO Regional Implementation Programme related to the No Country Left Behind (NCLB) initiative. They would gain better visibility in ICAO relevant events. When expressing their needs, States looking for OJT opportunities for their CAA Inspectors are encouraged to, inter alia, indicate the number of trainees, the area(s) of specialization to be covered by the OJT, their preference on the location (nationwide or abroad) and the language(s) of delivery as well as the nature of expenses they intend to cover in this regard.

2.18 In order to support the implementation of the foregoing initiative, the following draft Conclusion is proposed:

**Draft EUR/NAT-DGCA Conclusion 2024/2 – Provision of OJT for CAA Inspectors**

That the ICAO Regional Director, Europe and North Atlantic:

- a) invite States to identify and share with the ICAO EUR/NAT Office their challenges related to the provision of On-the-Job-Training (OJT) for Civil Aviation Authority (CAA) inspectors in the various areas related to safety oversight, taking into consideration the complexities associated with the OJT process;
- b) review the information provided by States on their challenges related to OJT provision, with a view to helping support States in overcoming these challenges;
- c) invite States with support needs in the area of OJT to reach out to the ICAO EUR/NAT Regional Office; and
- d) invite States to inform the ICAO EUR/NAT Office of their intention to offer OJT opportunities for CAA inspectors from other States in the EUR/NAT area based on delivery modalities to be agreed upon between the donor and recipient States.

*Opportunities to build bridges within and beyond the aviation ecosystem for enhanced training solutions*

2.19 The aviation sector is facing emerging challenges, which are transforming it and will deeply transform it in the years to come. These challenges are first and foremost linked to the development of a more sustainable aviation, in line with the ICAO objective of carbon neutrality by 2050. It also concerns the digital revolution with the development of Artificial Intelligence and other topics like the introduction of new air mobilities such as Urban Air Mobility (UAM) or drone traffic and their integration into legacy Air Traffic Management (UAS (Unmanned Aircraft Systems) Traffic Management (UTM) or U-Space).

2.20 To face these emerging challenges, the aviation industry must remain agile and regularly conduct workforce analysis and forecasting to identify any gaps and needs in terms of skill shortage and training capacity. It is also crucial to invest in comprehensive workforce training and development programmes aimed at attracting, educating, and retaining the current and next generation of aviation professionals. These programmes should focus on bridging the identified gaps, providing relevant training and education to embrace sectoral changes, innovation, and the latest technologies, and position the aviation sector as an appealing career choice.

2.21 In order to help overcome existing and emerging challenges, further efforts should be made to better identify relevant and targeted training solutions. In addition, training organizations should be strongly encouraged to continue to build bridges within and beyond the aviation ecosystem by focusing on the following elements:

- a) **Collaboration within the aviation ecosystem:** Foster partnerships with aviation companies, training organizations, and experts to pool resources and share best practices in training methodologies.
- b) **Technology Integration:** Embrace cutting-edge technologies such as virtual reality (VR) and augmented reality (AR) to simulate realistic training scenarios, providing a more immersive learning experience.
- c) **Cross-Sector Collaboration:** Extend collaboration beyond aviation by engaging with stakeholders beyond the aviation ecosystem to help better address domains such as sustainability and climate change, resilience, cybersecurity, crisis preparedness and management (including for public health-related events), digitalization and artificial intelligence, in order to bring in various perspectives and insights.

- d) **Educational Partnerships:** Work closely with training and educational institutions to develop curriculum enhancements, ensuring that training aligns with industry needs and incorporates the latest advancements.
- e) **Networking Events:** Organize conferences, seminars, and workshops that bring together professionals from various fields to exchange ideas, share experiences, and explore collaborative opportunities.
- f) **Research and Development (R&D):** Invest in R&D initiatives to stay at the forefront of training innovations, encouraging a culture of continuous improvement and adaptation to emerging technologies.
- g) **Adaptability:** Stay flexible and adaptive to changes in technology and industry requirements, ensuring that training solutions remain relevant and effective over time.

2.22 In order to facilitate the implementation of the above actions, the following draft Conclusion is proposed:

**Draft EUR/NAT-DGCA Conclusion 2024/3 – Opportunities to build bridges within and beyond the aviation ecosystem for enhanced training solutions**

That the ICAO Regional Director, Europe and North Atlantic:

- a) invite States to reach out to ICAO for any need of support for strengthening their training capacity through the creation or upgrade/enhancement of aviation training organizations under dedicated capacity building projects;
- b) invite States, international and regional organizations, and other relevant stakeholders to continue cooperating with ICAO and its TRAINAIR PLUS Programme network on the issues highlighted at the EUR/NAT-DGCA/2024 meeting; and
- c) convene regional meetings of States, international and regional organizations, and other relevant industry stakeholders in the EUR/NAT area to initiate dialogue regarding education and training on cross sectoral issues.

**3. Action by the Meeting**

3.1 The meeting is invited to:

- a) note the information provided;
- b) amend as necessary and endorse the proposed Conclusions; and
- c) provide directions as deemed necessary.

— **END** —