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HARMONIZED ATSEP TRAINING: EMPHASIZING SYSTEM INTERCONNECTIVITY AND LESSONS FROM RECENT OUTAGES

(Presented by the International Federation of Air Traffic Safety Electronics Associations (IFATSEA))

EXECUTIVE SUMMARY

This paper highlights the critical importance of harmonized training for Air Traffic Safety Electronics Personnel (ATSEP), with a focus on the growing interconnectivity of systems in modern air traffic management (ATM). It references recent system outages in Newark, New Jersey, and Milan, Italy, to illustrate the operational and economic risks posed by insufficient cross-system awareness. The paper also reflects the position of the International Federation of Air Traffic Safety Electronics Associations (IFATSEA), which advocates for the implementation of Competency-Based Training and Assessment (CBTA) in accordance with the *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868).

<i>Strategic Goals:</i>	This working paper relates to <i>Every Flight is Safe and Secure</i> .
<i>Financial implications:</i>	
<i>References:</i>	Doc 10057, <i>Manual on Air Traffic Safety Electronics Personnel (ATSEP) Competency-Based Training and Assessment</i> Doc 9868, <i>Procedures for Air Navigation Services – Training</i> EASA Regulation (EU) 2017/373 EUROCONTROL. (2020). <i>EUROCONTROL Specification for the ATCO Common Core Content Initial Training</i> . Brussels: EUROCONTROL

1. INTRODUCTION

1.1 Air Traffic Safety Electronics Personnel (ATSEP) are essential to the safe and efficient operation of air navigation services. As aviation systems become increasingly integrated, spanning surveillance, communication, navigation, and automation, the need for harmonized training that reflects this interconnectivity is paramount.

1.2 This paper outlines the rationale for harmonized ATSEP training and presents recent system failures as case studies to emphasize the operational consequences of fragmented or outdated training approaches.

2. THE NEED FOR HARMONIZED TRAINING

2.1 The evolution of air traffic management has introduced unprecedented complexity, with critical systems now deeply interlinked both within and across national boundaries. Incidents such as the Newark and Milan outages have revealed how a disruption in one subsystem can cascade rapidly, affecting communications, surveillance, or automation far beyond its point of origin. In these scenarios, personnel trained only in isolated technical domains may lack the situational awareness or cross-disciplinary knowledge needed to respond effectively, increasing both recovery time and the potential for missteps.

2.2 Recognizing these vulnerabilities, harmonized ATSEP training seeks to cultivate a broad, integrated competence base. Such training ensures that technical staff are not only proficient in their own specialties but also possess a foundational understanding of interacting systems, enabling them to anticipate risks and coordinate swiftly in crisis situations. Harmonized training also facilitates cross-border collaboration and interoperability, ensuring consistent operational standards and shared safety culture across States and organizations.

2.3 To support this approach, several international frameworks provide structured guidance on harmonized, competency-based ATSEP training. Among these are ICAO Doc 10057, EUROCONTROL's Common Core Content (CCC), and EASA Regulation (EU) 2017/373, all of which emphasize modularity, performance-based assessment, and real-world applicability.

3. IFATSEA POSITION ON CBTA AND PANS-TRG

3.1 In working to establish global frameworks, the International Federation of Air Traffic Safety Electronics Associations (IFATSEA) continues to encourage the consistent adoption of Competency-Based Training and Assessment (CBTA) across all ATSEP training programs. This recommendation stems from a shared concern within the community about varied standards and fragmented curricula among States and organizations, which can hinder operational cohesion and effectiveness.

3.2 To address this disparity, IFATSEA fully endorses CBTA as the universal benchmark for ATSEP training.

3.3 This endorsement is grounded in alignment with ICAO Doc 9868, Procedures for Air Navigation Services, Training (PANS-TRG), which offers comprehensive guidance for developing, implementing, and validating CBTA programs for aviation personnel.

3.4 ICAO Doc 10057: Manual on Air Traffic Safety Electronics Personnel (ATSEP) Competency-Based Training and Assessment, further strengthens this foundation by establishing a globally recognized framework for CBTA. It outlines core and context-specific competencies, modular training design, and integration of operational scenarios, all aligned to real-world performance requirements.

3.5 IFATSEA affirms that CBTA delivers measurable benefits, including tailored training, performance-based evaluations, and continuous system improvement through structured feedback mechanisms.

4. SYSTEM INTERCONNECTIVITY IN ATM

4.1 To understand the implications of CBTA in modern operations, it's essential to recognize the depth of system interconnectivity in current ATM environments. Each system, whether surveillance, communication, navigation, or automation, is now part of a tightly coupled infrastructure where failure in one domain can ripple across others with immediate impact.

4.2 Modern ATM relies on a tightly coupled network of systems, including:

- a) surveillance (e.g., radar, ADS-B, multilateration);
- b) communication (e.g., VHF/UHF, VoIP, data links);
- c) navigation (e.g., GNSS, ILS, PBN);
- d) automation (e.g., FDP, conflict detection); and
- e) cybersecurity and digital infrastructure.

4.3 Such interdependency requires ATSEP to go beyond specialized training and cultivate systems-thinking and diagnostic agility. These interconnections are no longer abstract; they materialize in operational disruptions. The following case studies offer a powerful lens into how infrastructure gaps and insufficient training coordination have resulted in widespread consequences.

5. CASE STUDIES: SYSTEMIC FAILURES AND OPERATIONAL VULNERABILITIES

5.1 The following case studies demonstrate how gaps in infrastructure resilience and cross-system coordination can lead to major disruptions and underscore the pivotal role of trained ATSEP personnel in safeguarding continuity.

5.2 Newark Liberty International Airport, United States (May 2025)

5.3 On 7 May 2025, a telecommunications failure at Philadelphia TRACON Area C resulted in a total loss of radar and radio communication with aircraft operating in Newark Liberty International Airport (EWR) airspace. The incident exposed a critical vulnerability in infrastructure reliant on single-link systems with minimal redundancy, rendering air traffic controllers effectively blind for over 90 seconds.

5.4 Operational Impact

- a) Complete loss of situational awareness and aircraft communication
- b) Immediate ground stop with widespread delays cascading through the network
- c) Severely reduced traffic flow, amplifying systemic disruption

5.5 Economic and Human Cost

- a) Over 1,000 flights delayed or cancelled in the following days
- b) Multiple controllers took medical leave due to acute stress
- c) Airlines absorbed millions in rebooking, accommodation, and crew logistics

5.6 Milan Area Airports, Italy (June 2025)

5.7 On 29 June 2025, a dual-link radar transmission failure at Milan Area Control Centre (ACC) caused a two-hour shutdown of northwest Italy's airspace, revealing a troubling lack of system resilience and contingency planning.

5.8 Operational Impact

- a) Over 320 flights cancelled or diverted across Malpensa, Linate, Bergamo, Turin, and Genoa airports
- b) Airspace closed from 2020 to 2220 local time; full operations resumed near midnight
- c) Thousands of passengers stranded, requiring emergency accommodation

5.9 Economic and Human Cost

- a) Airlines incurred rerouting and compensation costs under EC 261/2004
- b) An estimated 40,000 seat capacity was lost over the weekend due to crew and aircraft displacement
- c) Consumer advocates demanded formal inquiries into the lack of system redundancy and reliance on a single telecom provider

5.10 These events highlight the underlying fragility of the global CNS/ATM infrastructure, demonstrating how single-point failures can escalate into widespread operational paralysis. They affirm that robust system design and technical redundancy are not luxuries, they are imperatives. Central to this resilience are the ATSEP professionals, whose technical expertise in maintaining, troubleshooting, and fortifying these complex systems is essential to both prevention and rapid recovery during system failures.