



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**Twenty-Seventh Meeting of the AFI Planning and Implementation Regional Group
(APIRG/27)**

5 to 6 November 2024

Agenda Item 3: Implementation of air navigation goals, targets and indicators, including the priorities set in the Regional Air Navigation Plan.

3.6. Other Air Navigation Initiatives

Establishment of the ICAO True North Advisory Group (TRUEAG)

(Presented by South Africa)

SUMMARY	
<p>This working paper outlines activities relating to the establishment of the ICAO True North Advisory Group and the activities which require consideration and action by AFI-Region.</p> <p>Action by the Meeting is contained in paragraph 3</p>	
<i>Strategic Objectives</i>	<p>Related ICAO Strategic Objective(s): ICAO Strategic Objectives: A – Safety, B – Air Navigation Capacity and Efficiency, D – Economic Development of Air Transport</p>

1 INTRODUCTION

- 1.1 The magnetic compass is the most fundamental instruments used by the pilot to determine or verify aircrafts heading. It operates by detecting the geomagnetic field generated by electrical currents in the Earth’s core, as well as deposits of iron and other chemical elements in the Earth’s crust.
- 1.2 Magnetic North is our main reference for aircraft navigation today. There is interest, however, in making a transition to an aviation heading and track system based on True North instead. It is thought that this could lead to improved safety and reduced costs.
- 1.3 Magnetic declination (referred to as magnetic variation in the aviation sector) is the angle between true and magnetic North. This angle varies with position, and due to the temporal variability of Earth’s magnetic field and movement of the magnetic north pole, changes

over time at varying rates in different locations.

- 1.4 The rate of change on a yearly basis is dependent on your location in relation to the magnetic poles. Annual changes are therefore more significant in areas closer to the magnetic poles.
- 1.5 The magnetic variation information is used in a variety of aviation systems such as Air Traffic Management (ATM) systems, aircraft flight management systems (FMS), nav aids and wind direction indicators, etc. The runway (RWY) direction indicators are also defined in degrees magnetic.
- 1.6 Current state for use of magnetic as a reference for navigation presents known safety risk and inefficiencies within the global aviation ecosystem. Multiple Magnetic Variation models in use across aviation cause systematic and latent errors in navigation systems with associated safety risks and system interoperability /data exchange between air operators, ANSPs, and airports.
- 1.7 Adoption of True North Reference is an opportunity for the global aviation community to adopt a progressive, safer, and more efficient reference for air navigation. This subtle but impactful change can be managed in a safe and efficient way with a persistent focus on sound change management, communication, and collaboration across all stakeholders in the global aviation community.
- 1.8 During the Twelfth and Thirteenth Air Navigation Conferences (AN-Conf/12 and AN-Conf/13), in 2012 and 2018 respectively, Canada presented working papers with a proposal to move from a magnetic to a True North reference for heading and track in air operations, to enhance safety and reduce the considerable cost of maintaining magnetic variation (MAGVAR) tables.
- 1.9 The Conferences recommended that ICAO investigate the technical and operational impact and/or merits, as well as the potential cost of the proposed change across the spectrum of aviation activities prior to progressing the adoption of “True North” as a global reference.
- 1.10 During the Instrument Flight Procedure Panel (IFPP) 15 held in March 2022, a working paper was presented by Canada for IFPP to consider a global switch to true north. The Panel supported the initiative but requested ICAO to carry out a survey to investigate the level of support of States and industry for such a proposal.

2. DISCUSSION

- 2.1 ICAO circulated State Letter: SL AN11/57-22/87 on 21st September 2022 requesting States to complete a survey with inputs from all relevant stakeholders including air navigation service providers, aerodromes, air operators, aircraft or other original equipment manufacturers (e.g. FMS manufactures), and flight procedure design organizations.

- 2.2 The survey objectives included:
- 2.2.1 Determine the level of support of States and their aviation industry for ICAO to work on moving to true north.
 - 2.2.2 Identify any concerns or challenges that may need to be addressed for a transition to true north.
 - 2.2.3 The findings of the survey may be used to aid ICAO in developing any plans and strategies for migrating from magnetic to true north reference system for heading and tracking in air operations.
- 2.3 Subject to the responses received from the States, the Air Navigation Commission (ANC), at the seventh meeting of its 224th Session, held on 7 November 2023, supported the establishment of the True North Advisory Group (TRUE-AG) which was circulated to States through State Letter AN 11/65-IND/24/1 dated 21 January 2024, requesting States to nominate experts to support the initiative. South Africa submitted nominations for consideration by ICAO, which were accepted.
- 2.4 The TRUE-AG was established to assist ICAO in developing a framework for a transition to True North as the reference system for heading and tracking in air operations, including conducting in-depth studies, developing a Concept of Operations (CONOPS) and transition plan, and providing strategic advice to ICAO. The work of TRUE-AG, including the framework, will form the basis of the decision to be made on whether the international aviation community will move to True North and the possible implementation phases.
- 2.5 The TRUE-AG kick-off meeting was held virtually on 13th March 2024, setting the tone for the follow up engagements and activities of the advisory group including:
- 2.5.1 Reviewing the Terms of Reference for the TRUE-AG.
 - 2.5.2 Defining roles and responsibilities for True-AG.
 - 2.5.3 Reviewing survey results – objectives, methodology and results.
 - 2.5.4 Reviewing ICAO Annexes affected.
 - 2.5.5 Defining future engagement schedule.
- 2.6 The 3rd TRUE-AG meeting was held in Montreal, Canada between 6-10 May 2024 where a draft Concept of Operations (CONOPS) was developed including categorising the potential impacted areas under Laws and Regulations (Policy, Instructions), Orders and Standards (all standards), Organisations (ICAO, ANSPs, Airports, Airlines, etc), Training, Material (Hardware, Software, RWY Markings, etc.), Personnel (ATC, Pilots, etc) and Facilities (Airports, Nav aids, Radar, ATM Systems, publications, etc).
- 2.7 Key identified implementation related activities include:
- 2.7.1 The need for a global transition plan and Concept of Operations (CONOPS) supported by SARPs and guidance material.

- 2.7.2 Harmonized transition and coordination with all relevant stakeholders.
 - 2.7.3 Buy-in from States and awareness promotion.
 - 2.7.4 Cost benefit may need more analysis.
- 2.8 A follow up hybrid meeting was held from the 9th–13th September 2024 and it focused on
- 2.8.1 ANSPs - Determining the level of effort, scope and schedule to bring the State or region into alignment with true north.
 - 2.8.2 Aerodromes - Determining the level of effort, scope and schedule to bring the airports into alignment with true north.
 - 2.8.3 Aircraft operations - Flight plan the route and document on the navigation log and determine if the aircraft can safely navigate the flight.
- 2.9 Two virtual meetings and two physical meetings are arranged per year and there is notable progress in the assignment to this group. The dates and venues for meetings until 2026 have been communicated.
- 2.10 South Africa is actively participating in the TRUE-AG meetings and associated activities, however, have noted that participation from AFI perspective is limited.
- 2.11 The impact analysis, especially from an AFI Regional perspective, to support the development of a global transition plan and Concept of Operations (CONOPS) supported by SARPs and guidance for consideration by ICAO, would require extensive contributions from an AFI Regional perspective considering the ATM systems, aircraft equipment and operational impact from a planning perspective.

3 ACTION BY THE MEETING

- 3.1 The meeting is invited to:
- a) Review and discuss the aspects raised within this working paper relating to the activities of the TRUE-AG, the impact to the AFI Region of a transition from magnetic to true north reference system for heading and tracking in air operations and the importance of participation in the TRUE-AG.
 - b) Encourage States to nominate members and advisors to participate in the TRUE-AG.
 - c) Consider the requests emanating from State Letter SL AN11/57-22/87 and AN 11/65-IND/24/1 respectively and , endorse the establishment of a Project Team under the APIRG to support the activities of the TRUE-AG from AFI Regional perspective.
