الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY

United Arab Emirates

True North Advisory Group (True-AG)

MID Region Awareness Briefing

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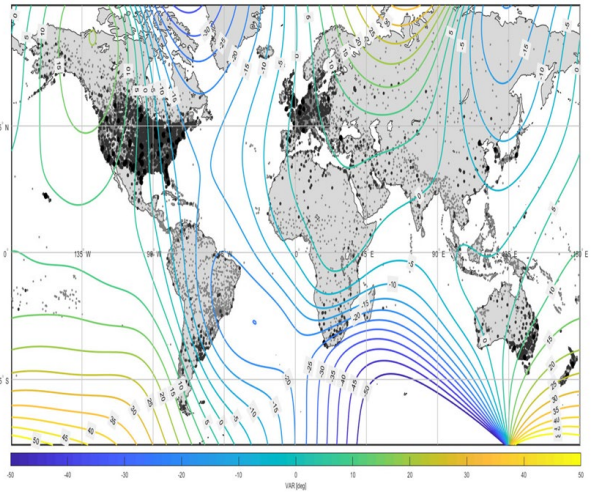
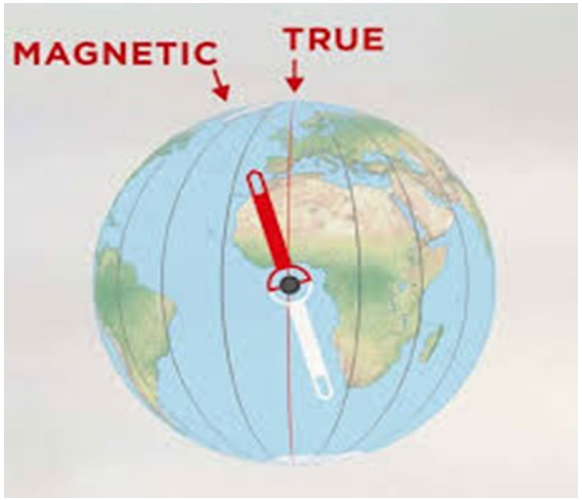
What is True-AG?

True North Advisory Group is **a closed ICAO group** established to assist ICAO in developing a framework for a safe and efficient global transition to True North, including conducting in-depth studies, development of a CONOPS and transition plan, and providing strategic advice to ICAO.

Meeting cadence (2024-2027): 2 in-person and 8 virtual meetings per year





Scope of Work Overview

- Evaluating impacts across the entire airspace system, including:
  - Navaid systems
  - Aerodrome operations
  - Air Navigation System Provider systems
  - Air Traffic Control, procedure design, and publication
  - Avionics and autoflight systems compatibility
  - Standards development
  - Training
  - Human factors considerations
- Impacts will drive timeline, transition plan and concept of operations
- Cost-benefit analysis, safety assessment, SWOT analysis for entire system implementation

What's the Issue?

- States and ANSPs follow ICAO Annexes and PANS-OPS SARPS, updating magnetic variation according to 5-year EPOCH models produced by government sources. Navigation aids like VOR and TACAN are required under ICAO Annex 10 to be maintained within +/- 2° (Annex 10 Volume I, 3.3.3.2 (VOR) and PANS-OPS Volume II Part I — Section 2, Chapter 4 § 4.3.3.3).
- Individual States establish the interval for the periodic evaluation of instrument flight procedures. The maximum interval for this review shall be 5 years. (See Annex 11, Appendix 7).
- No mandate exists to keep aircraft system magnetic variation tables current. Some aircraft systems are not capable of being updated.
- Currently, there is a discrepancy between air and ground regarding the guidance for updating magnetic variation information.
- Various magnetic variation values across different aviation platforms may cause systematic and latent errors in navigation systems which may result in safety risks, systems and sub-systems interoperability, and data exchange issues between air operators, air navigation service providers and aerodromes.

Transition Options

3 options are being considered for transition

Change to True North

i. One time, i.e. all at once was considered but realized that it is not possible

ii. Phased-Approach 1, i.e., change northern latitude first, and so on…

iii. Phased-Approach 2, i.e., develop Transition Plans (Global, Regional, State)

Note: Regional includes Oceanic

Keep magnetic variation (MagVar) tables updated

Mitigate issues, i.e., training pilots, updating MagVar across all interests through regulations, etc.

Hybrid Model

Hybrid: Keep MagVar tables updated and change to True North in the future

Definitions (Aircraft capability)

- **Not True capable:** Aircraft equipped with avionics that only provide magnetic reference
  - Note: Technically, any aircraft can be operated in a true environment given the crew has the capability to do manual conversion. The not capable definition would be set by regulations and airspace definition.
- **True Capable:** Aircraft capable of operating in a True North reference environment in all phases of flight with system dependencies on magnetic references
- **True Capable with restrictions:** A true capable aircraft with operational restrictions
- **True Native:** Aircraft that have no dependencies on a magnetic reference system to enable operations in a True North environment and for all phases of flight
  - Note: A True Native aircraft would still require the use of MAGVAR tables to convert from a True to Mag heading in order to operate in a magnetic referenced environment.

Transition Planning Factors

- Evaluate equipment capability and performance needs
- Assess cost impacts across all involved stakeholders
- Consider human resources and training requirements involved
- Update standards to align with new processes and technologies
- Review regulations to ensure compliance with aviation standards
- Define boundaries for operational and procedural changes

Examples of ongoing considerations

- Gap between areas of the True-AG who want to get rid of the need to update MagVar tables due to cost, etc. versus the areas who are not updating. Cost and personnel are major factors to consider.
- Gathering cost
- Need to define how we would operate where there is a boundary, i.e., for vertical and horizontal.
- Standards that need to be updated – RTCA, EUROCAE, ARINC, etc.
- Regulations that need to be updated
- Impacts to training pilots, air traffic control, dispatch, etc.

Summary of AIRP/12 Working Paper (Presented by ICAO True North Advisory Group)

- **True-AG identified a systemic discrepancy between ANSP/AIM magnetic data and aircraft onboard MagVar tables.**
  Modern aircraft align to **True North**, then convert to **Magnetic North** using internal models that are not always updated.

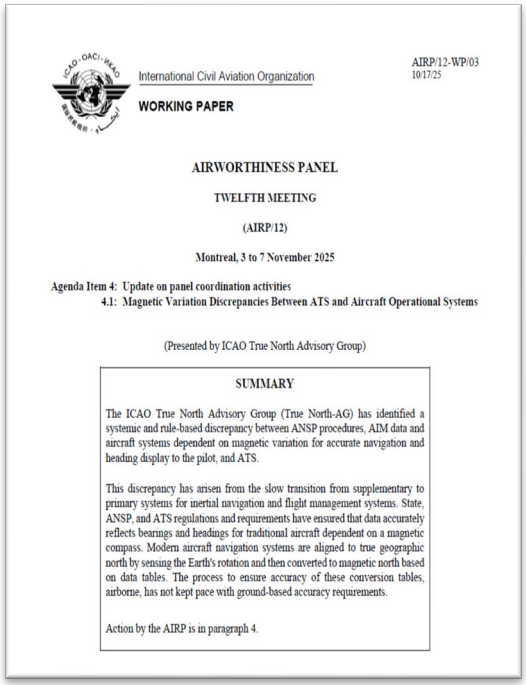
- **The rate of global magnetic drift has accelerated**, making the traditional 5-year MagVar update cycles insufficient for safe operations.

- **Ground systems (ANSP, aerodromes, charts) follow ICAO Annexes**, ensuring updated MagVar values, but **aircraft often operate with older MagVar tables**, and some systems **cannot** be updated at all.

- **This mismatch creates latent and systemic risks:**
  – Incorrect heading/track references
  – Data inconsistency between ATS and aircraft
  – Interoperability issues across navigation systems
  – Potential non-compliance with airworthiness intent

- **True-AG notes the regulatory framework has not kept pace** with the shift from magnetic-based navigation to inertial/true-based systems.

- **The Panel (AIRP) is asked to clarify how airworthiness can be ensured** for aircraft with:
  – MagVar systems that **cannot be updated**, or
  – Systems that **can be updated but are not updated in a timely manner**



International Civil Aviation Organization

AIRP/12-WP/03
10/17/25

WORKING PAPER

AIRWORTHINESS PANEL

TWELFTH MEETING

(AIRP/12)

Montreal, 3 to 7 November 2025

Agenda Item 4: Update on panel coordination activities
4.1: Magnetic Variation Discrepancies Between ATS and Aircraft Operational Systems

(Presented by ICAO True North Advisory Group)

SUMMARY

The ICAO True North Advisory Group (True North-AG) has identified a systemic and rule-based discrepancy between ANSP procedures, AIM data and aircraft systems dependent on magnetic variation for accurate navigation and heading display to the pilot, and ATS.

This discrepancy has arisen from the slow transition from supplementary to primary systems for inertial navigation and flight management systems. State, ANSP, and ATS regulations and requirements have ensured that data accurately reflects bearings and headings for traditional aircraft dependent on a magnetic compass. Modern aircraft navigation systems are aligned to true geographic north by sensing the Earth's rotation and then converted to magnetic north based on data tables. The process to ensure accuracy of these conversion tables, airborne, has not kept pace with ground-based accuracy requirements.

Action by the AIRP is in paragraph 4.

ACTION BY THE MEETING

- Encourage MID States to **begin internal assessments** on the operational, regulatory, and technical impacts of transitioning to True North.
- Evaluate **manpower and resource requirements** for ANSPs, AIM/AIS, and operators.
- Assess **local carrier readiness**, including avionics update capability and procedural implications.
- Identify **training, awareness, and education needs** related to True North across national aviation stakeholders.
- States shall **submit their study outcomes** to ICAO MID through relevant subsidiary groups (PBN SG, ATM SG, AIM SG, etc.) so ICAO MID can consolidate regional input and **formally notify ICAO**.
- Support ICAO's future transition planning by contributing **regional perspectives and national findings** once available.

Thank You