



| ICAO

# INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY



**TENTH MEETING OF ASIA PACIFIC PERFORMANCE BASED NAVIGATION  
IMPLEMENTATION COORDINATION GROUP (APAC PBNICG/10)  
19-21 April 2023, Bangkok**

**WP/04 - Global & Regional Update**

**Moving from Magnetic to True North**

---

Vijay Kumar Mishra

Regional Officer, PBN, ICAO APAC RSO Beijing

Email - [vkmishra@icao.int](mailto:vkmishra@icao.int)

# Moving from Magnetic to True North

- Current ICAO Annex 4 — Aeronautical Charts, section 9.81 requires bearings, tracks and radials to be published in degrees magnetic.
- At the Twelfth and Thirteenth Air Navigation Conferences, 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.
- The Conferences recommended that further study on the technical, operational, and economic feasibility of changing to a "True North" reference system should be conducted.

# Moving from Magnetic to True North

## Issues:

- Differences between magnetic variation values in aircraft avionics systems and published magnetic variation values on charts can lead to pilot misinterpretation and potentially unsafe conditions during precision approaches and Autoland;
- Regular updating of magnetic variation data in aircraft, ATC systems and aeronautical charts;
- Maintaining runway signage and numbering to match magnetic orientation;
- Rotating VORs and TACANs periodically to account for magnetic variation; and
- Inconsistency of wind direction being reported in magnetic north by ATC but reported in true north by MET services, which can lead to errors when magnetic variation is significant.

# Moving from Magnetic to True North

- Canada, in cooperation with the International Association of Institutes of Navigation (IAIN), has been investigating the feasibility of this topic and presented an information paper at the High-Level Conference on Covid-19 (HLCC) in 2021 to provide an update to States.
- Canada is currently developing a Concept of Operations (ConOps).
- If "True North" reference is implemented among States it would mean the discontinuation of the traditional practice of converting aeronautical data from its original format in TRUE reference into a magnetic reference.
- It would simplify charting and aircraft operations and may result in considerable cost savings for air operators, air navigation service providers, airports, avionics original equipment manufacturers, and flight procedures designers going forward.

# Moving from Magnetic to True North

- ICAO conducted a survey through State Letter AN 11/57-22/87 to seek feedback from States and their aviation industry on the level of support for ICAO to commence work on changing from a magnetic to True North reference for heading and track in air operations.
- The survey was aimed to identify any concerns or challenges that may need to be addressed if True North reference is implemented.
- ICAO also conducted two webinars on Moving from Magnetic to True North on 8<sup>th</sup> September and 27 October 2022 to raise awareness on the subject.

Webinar material link ;

<https://www.icao.int/safety/OPS/OPS-Section/Documents/ICAO%20TN%20Webinar.pdf>

# Moving from Magnetic to True North

## Survey Result:

- Substantial participation, with 564 responses from 103 States, accounting for 53% of the 193 ICAO Contracting States.
- Diverse group of responders, such as, CAAs, air operators, ANSPs, aerodromes, OEMs, flight procedures designers, training organizations, and the military.
- Considerable support for moving to true north within a realistic timeframe;
  - with 61% of total respondents either strongly in support (38%) or somewhat in support (23%) of a change,
  - 30% answered neutral, and
  - 9% either somewhat did not support (5%) or strongly did not support (4%).
- The majority of respondents estimated that it would take their sector 10 years or less to implement true north in their State.

# Moving from Magnetic to True North

## Challenges Identified:

- The need for ICAO to develop a comprehensive transition plan supported by guidance and awareness activities (seminars, workshops, webinars etc.)
- Obtaining global acceptance among all States and industry stakeholders and achieving a harmonized transition to true north.
- Cost and effort to equip aircraft for True North operations, particularly older aircraft, and smaller general aviation aircraft.
- Potential unmanaged safety risks introduced during a transition to true north.

# Moving from Magnetic to True North

## Recommendation:

- ICAO to develop a CONOPS, along with a transition plan and timeframe, considering all stakeholders' needs, as a first step towards transitioning to a true north reference system.
- An ICAO interdisciplinary group, such as a Study Group or inter-panel group, may be needed to assist the ICAO Secretariat with developing these documents and to assist in creating a realistic and safe framework for a true north transition.

## Action by Meeting

The meeting is invited to:

1. note the information presented; and take action, as appropriate; and
2. provide update on the subject in subsequent meetings.



---

Thank You!